The development of the Eastern Province, with particular reference to urban settlement and evolution in eastern Saudi Arabia

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"The Development Of The Eastern Province"
With Particular Reference
To
Urban Settlement And Evolution
In
Eastern Saudi Arabia

A thesis submitted to the Faculty of Social Science,
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by

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TO

MY LATE FATHER

ABSTRACT

Since the discovery of oil in Saudi Arabia in 1938 the face of the country has completely changed. The aim of this thesis is to examine for the first time the changes which are observable in the settlements of eastern Saudi Arabia, changes attributable to oil. The area chosen is the Eastern Province (the oil region), and a study of this area reflects the scale of changes over the whole of Saudi Arabia.

The Eastern Province was formerly an agricultural area, its economy prior to the advent of oil being dependent on the Oases. Now, most of the agricultural workers have left the land for better paid jobs in the oil industry and associated industries. The first effect of this was to produce a relative decline in the agricultural economy of the region, and secondly, through a massive internal movement of people from the agricultural settlements, produce rapid growth in new settlements near the operations of the oil industry. Thirdly, many immigrants flocked to the Province, drawn by the new economic prospects and a better income, and these migrants settled both in places such as the old cities of Hofuf, Qatif and Mubarrez as well as in the newly developed towns of Dammam, Al-Khobar, Dhahran, etc.

The thesis comprises six integrally interwoven aspects of the study:-

1. The physical aspect of the Province, from a geographical point of view.

2. The original economy of the region - e.g., agriculture and pearl fishing and the changes which have come about by the discovery of oil and the resultant new economy.

3. The population and changes due to the economic factors.

4. The new phase of life, with particular reference to social services, and transport, communications.

5. The new economy resulting from oil and non-oil industries.

6. Sample studies of recent growth and functions of the most important selected urban centres, with regard to old and new settlements.

The last two chapters contain the conclusion of the study, in which the physical, cultural and economic factors are related to the geography of the Province.

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INTRODUCTION

STUDY AREA, AIMS, METHODS, SOURCES AND CONTENT

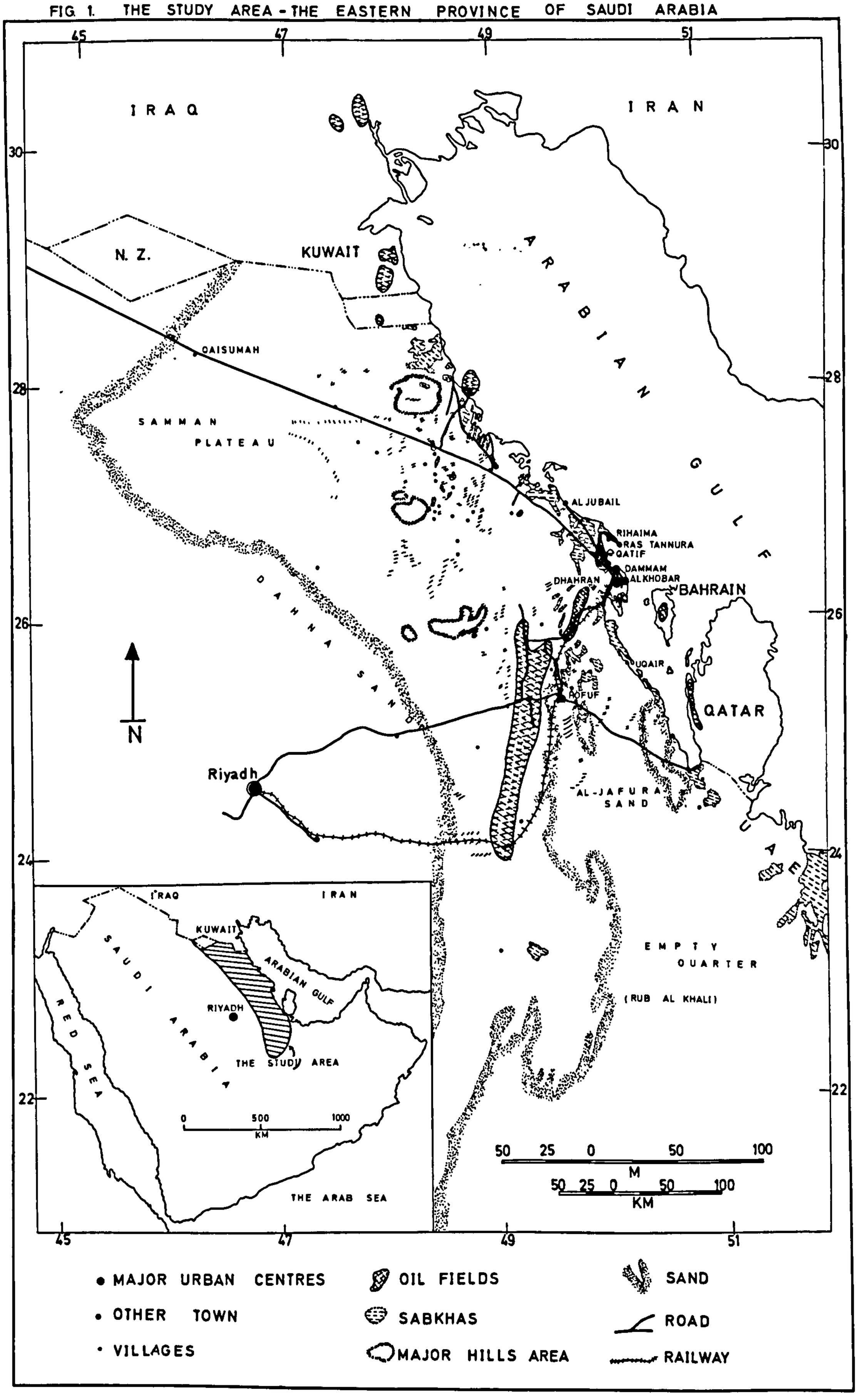
A. Study Area

The Eastern Province of Saudi Arabia occupies the eastern part of the Arabian Peninsula. The eastern physical boundary is the Arabian Gulf, on the west it is the great sand of Dahna, and from the south the boundary is the largest sand desert, Rub-Al-Khali (the empty quarter). The political boundary in the north is Kuwait, in the east Bahrain and Iran (off-shore boundaries) and in the south east it is Qatar and the United Arab Emirate (Fig. 1.).

In the study area lie two Oases - Al-Hasa to the south and Qatif in the north, both famous as agricultural areas and for their date gardens, which were the main source of income to the region prior to the discovery of oil in 1938. The oases are also famous for their springs of fresh water but long continued irrigation of a traditional type affected the soil of the cultivated areas by salinity, but new irrigation and drainage systems are designed to increase the cultivated areas in these oases.

The Eastern Province is the main oil production area of Saudi Arabia, and this production carried out by Aramco has had an enormous impact in improving the economy of the country. Prior to the discovery of oil, there were only about 288 sedentary settlements of any type in the Eastern Province, and the only towns were Hofuf, Mubarraz and Qatif, and the two small ports of Al-Jubail (north) and Al-Uqair (south). The remaining settlements were mainly nomadic bases and small farming communities. Hence, the improved economic situation has been of great benefit to the Province, the old settlements have been developed and new towns such as Dammam, Al-Khobar, Dhahran and Abqaiq and Rihaimah have

FIG. 1. THE STUDY AREA - THE EASTERN PROVINCE OF SAUDI ARABIA



sprung up; there are now 320 settlements of all types, with populations ranging from 4 to 51387 inhabitants (1962-63 Population Survey)

Prior to the discovery of oil, development in the region changed slowly if at all, as for centuries the people of the province had lived an agricultural or nomadic life with additionally a little fishing, and there had been no change in the small village settlements and towns suited to a purely agricultural economy. The advent of oil brought new wealth to the province, and enabled the authorities to plan extensive improvements and expansion programmes for the towns and cities of the region, with the aid of advice from immigrants to the area.

B. Aims of the Study

The first aim is to describe and explain the scale of development and growth of urban settlements in the Province from the discovery of oil up to the present day and to analyse the resulting spatial patterns. From 1950 the population of the Eastern Province has been greatly increased by immigrants who have changed the nature of the economy from a purely agricultural one to a centre of commerce and industry. This study is the first to attempt to describe the urban geography of this region and to attempt to explain the present aspect and the functions due to the discovery of oil. With reference to the importance of the study area, it can be classified as the third most important urban region in Saudi Arabia. Riyadh is the first, Mecca-Jeddah the second, and Dammam-Al-Khobar the third region.

My second aim in choosing this area as a sample, is to evaluate the way it reflects the real effect of the new economy on the whole of the region, and the influence of new immigrants on the settlements; it illustrates the dualistic pattern of social life which has developed in the old and new settlements. The findings are based on a range of available data of various kinds, together with information obtained from investigations during personal fieldwork.

C. Methods

Many problems were encountered during the fieldwork connected with this study (Summers of 1971 and 1973). These varied with the topic under study and the people it was necessary to interview, and a summary is given below:

i) Method of collecting data:-

The main sources for existing information were the Ministries and other government offices in Riyadh and in the Eastern Province; as we shall see the speed of change has been so great as to produce basic problems of information for the relatively youthful official agencies. A study of this kind is particularly hampered by the absence of published census material. Most material was obtained through personal relationships and via the intervention of friends, and in this way I managed to collect much so-called "confidential" data. Much of the material available to me had not been arranged or classified in any systematic way; a large amount of time had to be spent in arranging this material systematically before it could be analysed in my research.

ii) Time

Much valuable time was spent during my fieldwork through having to follow bureaucratic procedures in government offices and departments, especially in obtaining permission to distribute a questionnaire. I first applied to the government offices in Dammam,and was referred to Riyadh to the Ministry of the Interior, and the total time spent between filling the application and receiving official permission was over one month, before I could begin my fieldwork and distribute the questionnaire.

iii) Type of data

Most studies, theories and models require specific data for the proper execution of the project. To apply this method in the Eastern Province has been difficult, as there is insufficient relevant data to approach the problem along theoretical lines. Many government officials in the Eastern Province, when approached for information, reply either that

the information cannot be supplied in detail, or it is difficult to find, or there is no data available. The study was greatly hindered by the absence of relevant detailed data, and a great deal of this study work has been based on information collected in two field study periods (July 7 - August 30, 1971 and July 20 - December 29, 1973) even though comparability and evenness of coverage was impossible to guarantee in many cases.

iv. Methodology

Given the basic aims of this thesis the necessary methodology involves (a) the description of the physical characteristics of the region and the evaluation of their effects on urban settlement (b) the description of the facts of and underlying processes in economic activity, both in the region as a whole and in sub-regions and in urban settlements (c) the identification and analysis of functions, regional, urban, industrial, transport etc. (d) spatial analysis including urban morphology, internal urban functions and inter-urban hierarchies and linkages.

As noted earlier and below in Section D, the availability of existing data together with the severe limitations affecting a single researcher working in these particular circumstances, has meant that the personal research had to be highly selective if there was to be reasonable comparative coverage of a number of settlements as well as a reasonable coverage of themes and trends e.g., of population movement and of processes of urban growth.

The goal ultimately was designed to be the study of changing functional and spatial relationships through the application of recent concepts in urban and economic geography but in this region it was first necessary to examine the component elements at a variety of scales e.g. the Province, provincial sub-regions, the towns. The emphasis on process and spatial interpretation therefore is lowest in the opening sections and strongest in the last two chapters.

D. Sources

The sources of information for this study consist of published and unpublished data, maps, photographs, aerial photographs and information obtained during personal fieldwork.

i) Published data

1. Various works have been written in both Arabic and English about the Eastern Province, Saudi Arabia, the Arabian Peninsula and the Middle East.

2. Establishment surveys by the Ministry of Finance, Department of Statistics, 1967-1971.

3. The Statistical Year Books 1965 - 1973, by the Ministry of Finance, Department of Statistics.

4. Special studies of Saudi Arabia and the Province, published by the government and firms.

5. Annual Reports and Statistical Summaries of the Saudi Arabian Monetary Agency (SAMA), 1969 - 1974.

6. The Quarterly Bulletins and the Municipalities Services, published by the Municipality Department (1967-1972).

7. Annual Reports by the Oil Company (Aramco), presented to the Saudi Arabian Government (1953-1972).

8. Booklets about the Eastern Province, published by Aramco, at different dates.

9. Various periodicals published on both Arabic and English.

ii) Unpublished data

1. Population survey of the Eastern Province, 1962-63, carried out by the Government.

2. Special population studies of Saudi Arabia, carried out by the Government (in Arabic).

3. The 1971 survey of commercial and business establishments in Dammam and Al-Khobar, carried out by Aramco.

4. Studies and statistics of agriculture in the Eastern Province,

produced by the government, Aramco and firms.

5. Studies and reports in home ownership and other studies by Aramco and other firms.

6. Studies, statistics and reports on Dammam port and railway by the government and various foreign firms.

7. Studies, statistics and reports of the Eastern Province towns by the government and various foreign firms.

8. Lists of the industrial establishments up to 1972, by the Ministry of Commerce and the Industrial Studies and Development Centre.

9. Studies and reports on industries by the Industrial Studies and Development Centre.

10. List of roads built in Saudi Arabia (1973).

11. Data collected from various files in government offices.

12. Studies and statistics on weather in Saudi Arabia.

13. Statistics on education.

iii) Maps, photographs and aerial photographs

1. Maps Town planning maps, dated 1968, in a variety of scales for different cities and towns in the Eastern Province.

Aramco maps, on a variety of scales, dated between 1952-1971.

2. Photographs Various photographic views taken personally, and also by Aramco.

3. Aerial photographs and Mosaic The aerial photographs used in the study were from the Aramco Co., on different scales, dated between 1935 - 1972), and also other aerial photographs from the Ministry of Petroleum and Mineral Resources, dated 1968, for Dammam, Al-Khobar Dhahran, Qatif, Hofuf and other towns in the Eastern Province. The Mosaic for the central urban area of the Eastern Province (Dammam), was obtained from the Ministry of Petroleum and Mineral Resources. These together with (iii) i & ii provided the vital information for reconstructing urban morphological development.

iv) Personal Fieldwork data

Data was also obtained personally, from people in the Eastern Province whom I know, by requests in personal letters, and also by interviews conducted during the fieldwork.

The fieldwork was the greatest source of data collection, and of most benefit. The fieldwork involved:-

1. A personal survey for finding the location of commercial and industrial establishments and other functional units in the cities and towns of Dammam, Al-Khobar, Dhahran, Qatif and Hofuf, and also on the outskirts of these cities, in an attempt to make an inventory of functions in the main cities. This inventory was not restricted to the commercial units alone, but included all the functional units in the cities.
2. The collection of data not only from the Eastern Province itself, but also from Jeddah in the Western Province and from Riyadh the capital city of Saudi Arabia, where all Ministry and other offices are located, and involved in the Provincial services.
3. Questionnaires covering a wide range of information in Dammam and Al-Khobar such as place of birth, origin, religion, education, number of people in family; with reference to occupation, the type of job and wages paid, the amount of spending money; in housing, the type of house and materials used in construction, and the facilities within the house; with reference to transport and types of transport used in the cities, type of public services available and the type of goods marketed and manufactured within the city.

First official permission had to be obtained for the carrying out of questionnaire interviews and this together with the fact that this type of survey was new and strange in this area made it necessary (a) to severely restrict the number of settlements studies (b) to rely within the settlements on the sampling of several separated areas in each

town, each area chosen on a random basis, and (c) to make the questions simple and factual. The problem of illiteracy in some cases and in other cases the wish of the interviewee made it necessary to carry out personal interviews in about 30% of cases while for the remainder questionnaires were left for completion and for subsequent collection and discussion (see also Chapter 4 pp.103-128)

Response was variable overall but 60% response was achieved by using the nearest neighbour technique if the first selected interviewee would or not respond. Response was also partial and the proportion of clear answers to some questions such as housing quality, place of shopping etc. was so low as not to allow the statistical use of these data. However, the answers which were obtained were of some value to the interviewer in indicating at least some trends and values. For example, the general but often vague statements made concerning shopping trips corroborated the specialised nature of Al Khobar's retail trade as indicated by other evidence (see Chapter 8 Section D). Similarily questions concerning income were in many cases not answered at all or when checked turned out to be inaccurate; nevertheless there was general support for the indirect evidence (see Chapter 3 and Chapter 8 Sections A and B) for a relatively low disposable income in the oasis settlements as compared with the other towns.

The greatest value obtained from the questionnaire survey lay in the fields of demography and migration concerning the two towns of highest in-migration, Al Khobar and Dammam.

E. Content

Since this thesis is heavily concerned with dynamic change rather than a steady state situation, in the first three chapters not only is the physical environmental setting briefly described but also the processes and results of human adaptation to this setting. Partly during the period before oil induced development but also since the exploitation of oil, agriculture, fishing and the other age-old economic activities are examined to show how the rural background to urban situations has changed.

In Chapters 4 to 7 inclusive, the emphasis is mainly on the Provincial level study of demographic, economic and social phenomena as they have developed during just over 30 years of the significant growth of an oil-based economy. Here the emphasis is on the processes as well as recently observable facts.

In Chapter 8 the scale of study changes to the urban level at which the changes in physical morphology, functions, size etc. are examined in some detail, based on personal field-work in five case-study towns.

Chapter 9 is concerned with spatial analysis of urban functions at the internal urban level and the inter-urban level.

In Chapter 10 are presented the interpretative conclusions and a model of regional and inter-regional economic functional relationships in the Eastern Province.

References are listed at the end of each chapter or, in the case of Chapter 8, are appended to each of the sections which comprise the chapter. The bibliography is at the end of the thesis.

The statistical data presented in this work mainly date from 1972 or earlier. In all cases they represent the most recent data available to the writer except for the results of personal surveys carried out mainly during 1973.

CHAPTER ONE

TOPOGRAPHY AND GEOLOGY:

The eastern province lies parallel to the western shoreline of the Arabian Gulf, extending approximately 800 Km., in length from the Kuwait and Iraq-Saudi neutral-zone, south to the great sands of Rub Al-Khali, and 300 Km. in width from the great belt of the Dhana sands east to the Gulf coast.

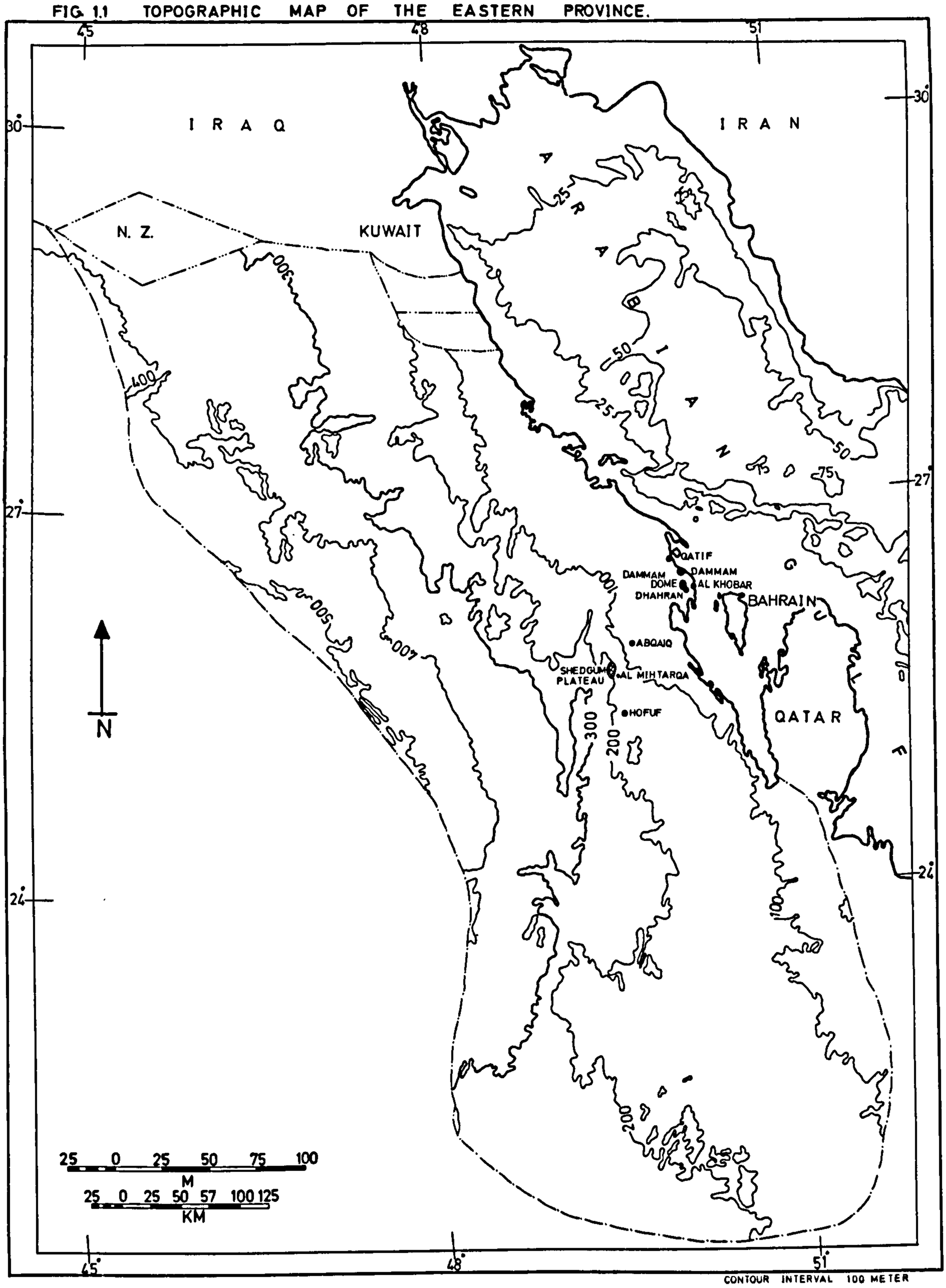
Sand covers great areas of the province away from the urban areas and oases; the Gulf shore is generally low and sandy. The sea for some distance from the coast is relatively shallow and full of shoals.[1.] Relatively near the sea in many places ground water is found within a few feet of the surface. The salt-flats called Sabkah are common in the Eastern Province where because of the evaporation of brackish water, salt is deposited on the surface, and usually an impure mixture of salt and sand forms a crust a few inches deep.

TOPOGRAPHY:

Crossing the Eastern Province from Dhana sand to the Gulf, the terrain generally slopes down to the Gulf and the littoral consists of a broad plain, dipping gently from the far interior. The terrain's surface rises in the north and north-west to the Kuwait and Saudi-Iraq (neutral zone) boundaries to an elevation from 400 to 100 meters above sea level. (See Fig. 1.1) The elevation of the land surface generally increases gradually from the coast towards the interior at the rate of about 1 metre per Km.

The landscape is composed of four main physiographic feature elements:

FIG. 1.1 TOPOGRAPHIC MAP OF THE EASTERN PROVINCE.



1. Rock hills and plateau: There are three groups of rock hills rising and gently sloping to the east and north-east. The highest point is about 329 metre to the west of Al-Ghawar field, and the lowest is 93 metre at Al-Jubail Al-Barri near the sea, in Al-Jubail area. The hills consist of a small group to the south-west of Kuwait, called Al-Moudaniat, a large group to the west of Al-Kharasaniya oil field in the Abu-Hadriya and Al-Niariya area and the biggest rock hill group, extending from the north-west of Abqaiq oil field to Al-Hasa and Haradh.

In addition the province consists of a hard rock plain called Summan plateau located between the coastal strip and the great belt of Dahna sand, and between 50 miles (80 Km) to 150 miles (241 Km.) wide. Summan is fairly flat, but to the east old stream channels and other forms of erosion have cut the plateau into irregular terrain. Isolated buttes and mesas as well as extensive table-lands, project into the coastal lowlands. The elevation of Summan averages about 800 feet, (160 metres) at its eastern edge and about 1300 feet (260 metres) at its western margin adjoining the Dahna Sands. Thus its westward rise is from three to four feet per mile or from 1.9 to 2.5 per Km.

2. Sand Plains: There are three main zones of sand which run through the urban and cultivation areas:

i. From Al-Jubail, northward to Kuwait Bay, the terrain consists primarily of low, rolling plains covered with a thin mantle of sand. In this area and in the west of Kuwait hilly terrain merges with the Dibdibah gravel plains to the north-west of the province. Through the centre of the gravel plains, the great valley of Al-Batin, runs north-east to the channels of the Tigris and the

Euphrates in the South of Iraq.

ii. Southwards from Al-Jubail there is a fairly wide belt of drifting sand often piled up into large dunes. This belt of sand runs to the south and merges with the sand area south of Al-Hasa known as Al-Jafurah, which in turn runs into the greatest sand of Rub Al-Khali. Ras-Tannura and Dahna lie adjacent to the northern portion of this sand covered area.

iii. The sand covered Abqaiq area is a flat plain parallel to the shore-line, running through Al-Hasa Oasis to join the Al-Jafurah sand which lies upon flat gravel plains which spread out in broad, gravelly sheets from the oasis of Yabrin.

The greatest sand dune area, Dahna, partly lies within the eastern province, and is one of the distinctive geographical features of Saudi Arabia. Dahna extends approximately 800 miles (1287 km.) shaped in a great arc from the great Nafud in the north to Rub Al-Khali in the south.

3. Sabkhahs: The coastal areas are not only covered with the sand but also are bare, rocky plains, as in the vicinity of Dhahran, broken by Sabkhahs. The Sabkhahs are salt flats, built up by deposition of silt, clay, and muddy sand in shallow water occurring in depressions where there are water seepages. Water is found within a few feet of the surface, and usually an impure mixture of salt and sand forms a crust a few inches deep. "The flat surface of the Sabkhahs is maintained at the level to which moisture rises above the static water level. Below the moisture level the sand, silt and dust are damp and fixed in place, but above the moisture level they dry out and blow away, leaving a flat surface. The surface is firm in dry weather and sometimes cracks into countless hard warped,

irregular pieces. The smooth and dry surfaces can be excellent for car driving, but rains turn the Sabkhahs into impossible morasses. After a short period of drying they may form a deceptively dry crust through which vehicles break, only to become mired in the mud below."[3]

The major areas of Sabkhahs are to the west and north west of Qatif City called Al-Dabbiyah, Al-Duraydi, and Al-Riyas, and to the north west of Al-Jubail town - Al-Fasl and Al-Murayr; the other areas of Sabkhahs are scattered over the land of the eastern province.

4. The Wadi Valleys: There are not many wadi valleys in the province that are important enough to supply water wells during the rainfall seasons, since the dune sands cover so much of the area. The valleys which exist as follows:-

i. Al-Batin, the great valley, runs through the centre of the gravel plains of Al-Dibdibah in the north-west of the province. The valley flows from the Dahna sand in the north east to the channels of the Tigris and the Euphrates in Iraq.

ii. Water Valley or Wadi Al-Miyah, is really a series of small elongated closed basins in a long north-south zone.[4] The valley starts from the rock hills near Al-Sirar, and runs northward up to the Al-Niayriya area towards the sea.

iii. Al-Sahba valley runs parallel to the Railway from Al-Manakhir area to Haradh then runs south east to Al-Jafura sand.

The presence of Sabkhahs and the dune sand in the eastern province considerably affects the value of land and urban growth in the future.

Sabkhahs are useless both for cultivation and as built up areas. For centuries the sand has threatened the cultivation areas in Qatif and Al-Hasa Oases; many parts have been buried under the sand and many water wells in the desert have been abandoned. Al-Khobar itself as a new city has been threatened by the dunes sand from the north and to stop the sand, the municipality has made a long wind belt of plantations on the north side to save the city. A few kilometers west of Al-Uqair, many gardens of palm and water wells have been buried by the sand from the north and north west. In Qatif Oasis to the west, north and north west, near Safwa town there are remains of former extensive cultivation and the former habitations sites give evidence of ancient farming 2,500 years old.[5]

Also in Al-Hasa Oasis a new scheme of stopping sand movement based on afforestation in three belts of plantations has been developed as a defence from the north, which is the open zone from which the wind blows. (See Fig.3.6 Chapter 3).

GEOLOGY:

In earlier geological epochs the sea of the Arabian Gulf was much more extensive sometimes reaching out to and partially covering an ancient mountainous land mass or shield (what is now the central part of western Saudi Arabia Hijaz region), and extended around the northern side of this land mass to what is now known as the northern part of Saudi Arabia, Jordan, Syria, Lebanon and Iraq.[6]

In these ancient seas were deposited limestone, mud and sand, which in their lithified forms, are seen today on the surface of the land as far west as and in some areas beyond the Tuwayq Escarpment. The thickness of these deposits increases gradually below the surface from their western margins eastward to the western shore of the Arabian Gulf to about 30,000 feet or 9144 metres thick and 40,000 feet

or 12571 metres farther east towards Iran.[7]

In Saudi Arabia there are two great distinct geological regions;

A. The ancient land mass or the Arabian Shield in the Central part of western Saudi Arabia which one extended across the Red Sea into Africa. The Arabian Shield is a vast, dominantly precambrian complex of igneous and metamorphic rock. This rock is cut in many places by intrusions of granite and other igneous rocks, including a number or both old and comparatively recent lava flows.

B. The sedimentary ancient rocks are much more recent than the old shield, against and over which they spread. The western boundary of the sedimentary province swings around the eastern Arabian Shield edge, roughly following the configuration of the large sand-covered areas beginning with Great Nofud north to Nofūd Al-Dahi. The sedimentary strata slopes or dips away gently in the north-east in northern Saudi Arabia, to the east in the Eastern Province and to the south-east into the Rub Al-Khali.

As the limestones and other strata seen on the surface in Central Arabia as at Tuwayq Escarpment are tilted gently to the east, they are found thousands of feet below the surface in the vicinity of Abqaiq and Dhahran where some of them yield oil. The limestones found on the surface at Dhahran likewise outcrop again at much higher elevation to the west.

On the eastern side of the Arabian Gulf there are the Iranian mountains of which are precambrian rocks in age and similar to these in the Arabian Shield of Western Saudi Arabia. The region between these two outcrops of precambrian rocks is a great basin. The trough of this basin now is occupied by the Arabian Gulf to the South and also by the valleys of the Tigris and Euphrates Rivers in North Iraq.

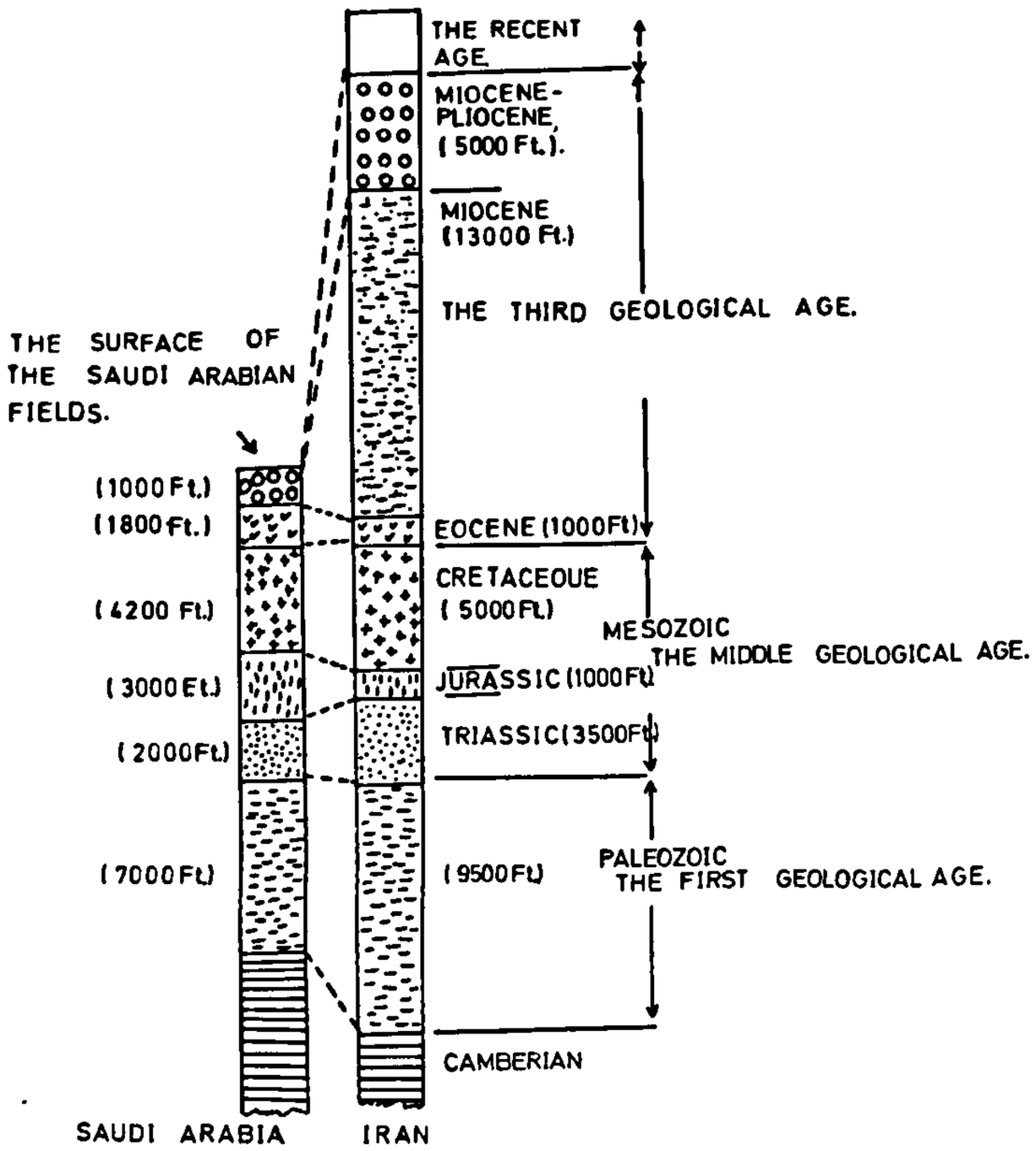
From the point of view of human occupance and settlements we can identify these geological phenomena which have been of significance.

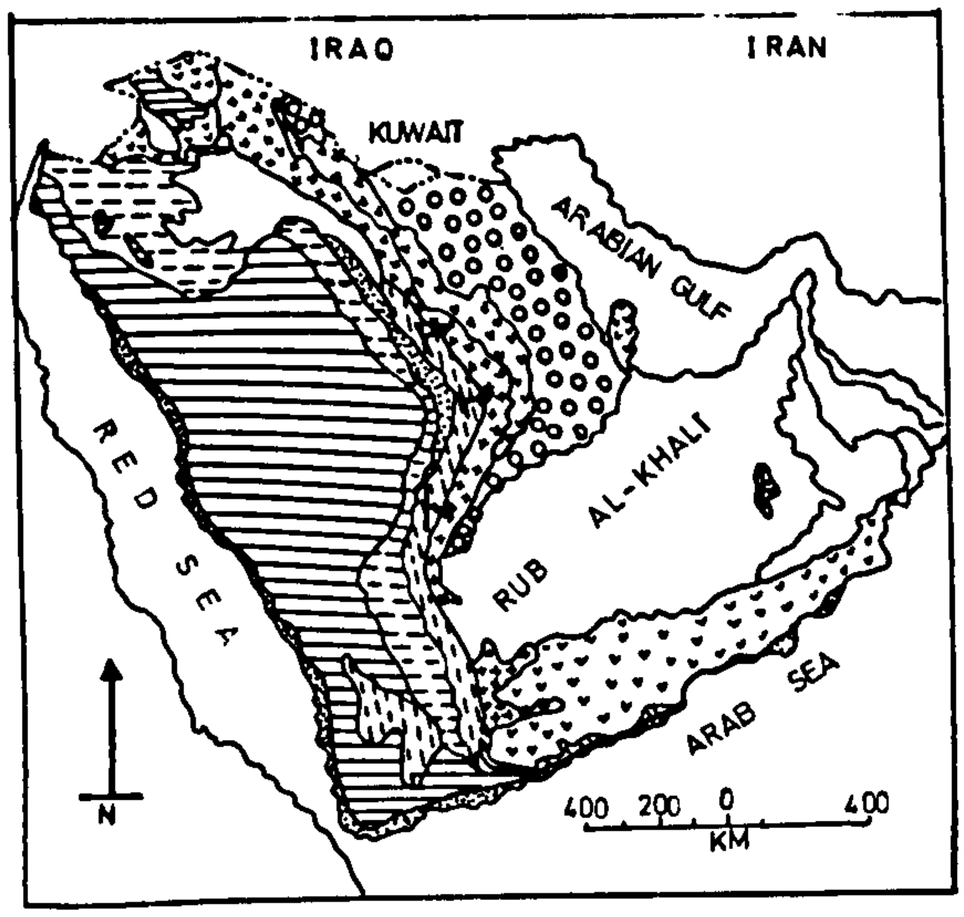
First, all the sedimentary rocks of permian and more recent age are dominantly calcarous ranging from the almost pure limestone to calcareous shales and mudstones. Secondly, the sedimentary strata have a consistent general dip towards the Arabian Gulf although this dip is disturbed by localised faulting and folding (Fig.1.2).

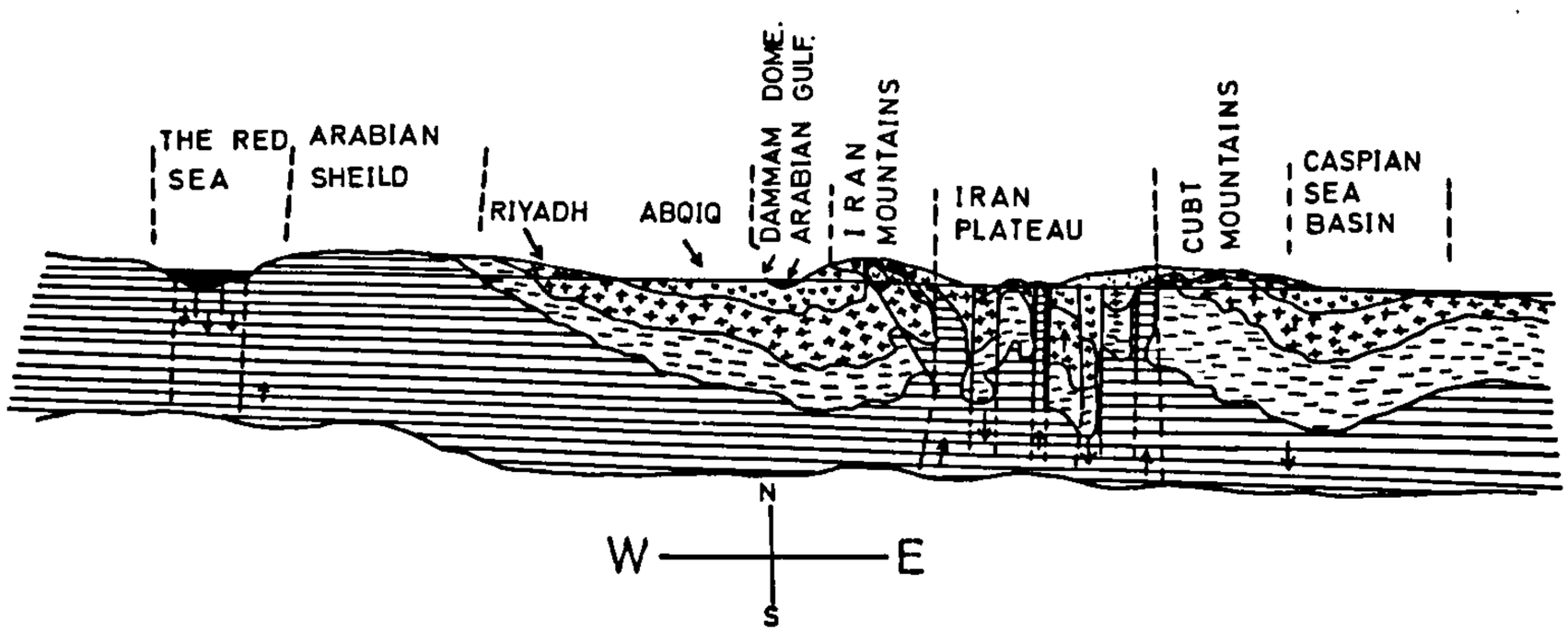
Until the 1930's human occupance of the Eastern Province was basically dependant upon agriculture and fishing as production activities. All farming and grazing was not only controlled by climate as shown in Chapters two and three, but by the characteristics of calcarous soils developed under arid conditions. Such soils are generally deficient in available minerals and nutrients for plants and difficult to manage.[8] Farming settlement for centuries has been limited to a small number of areas where other factors, such as water supply, were particularly favourable.

Since this is a sub-tropical arid region to which, unlike for example, Egypt, there is no hydrological supply of surface water from more humid regions, human life is dependant upon the availability of groundwater. The Eastern Province is fortunate (see pp 56 Chapter 3) in that both fossil water from more humid climatic periods and that which comes from contemporary rainfall, in general moved from west to east within many of the sedimentary series along the dip-slope.

At and near sea-level in the Eastern Province aquifers are partly forced to the surface by the damming effect of the highly saline Gulf water which penetrates the more superficial sedimentary rocks and are partly brought near the surface by the near coinciding of the topographic gradient with the general geological dip. Springs and shallow aquifers have thus made it possible at some locations, depending on details of geology and geomorphology, for man to establish oases for damming or watering points and wells for himself and livestock (see also Chapter 3 pp.56-57).







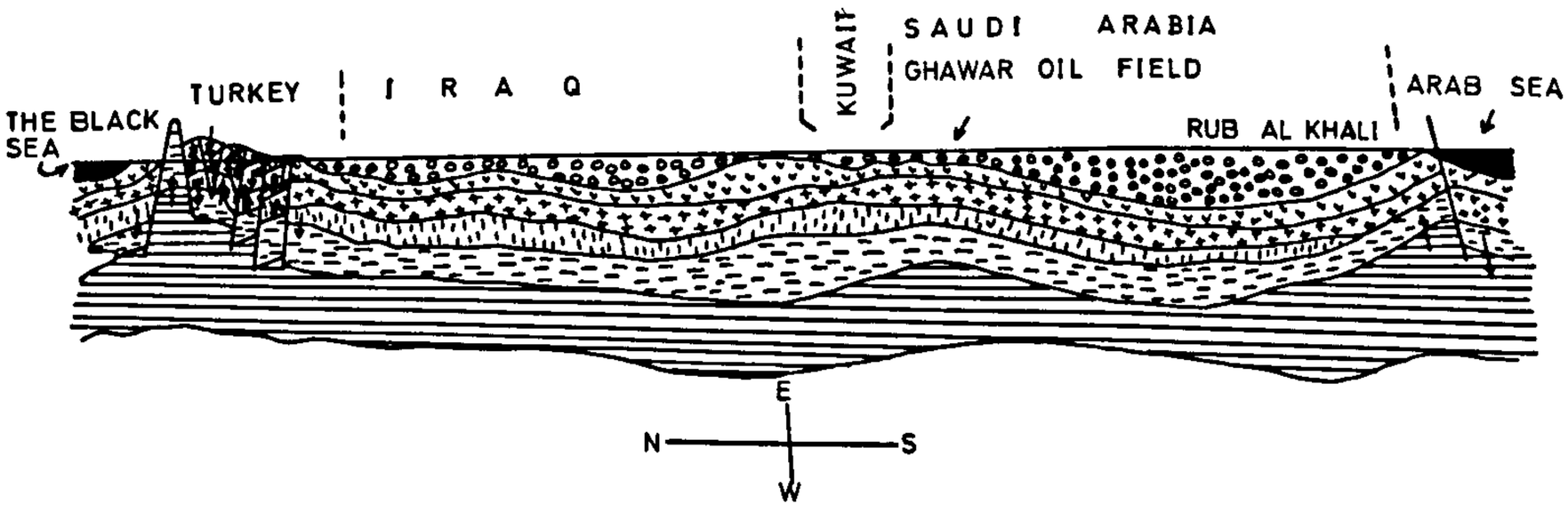


FIG. 1.2 GEOLOGICAL DIAGRAMS OF THE ARABIAN PENINSULA.

Thirdly, the calcareous beds, particularly those relatively near the surface do not supply good quality quarry stone and local stone is almost always weak and friable. The only local stone generally used for building has been obtained from residual surface boulders. Clay suitable for the making of sun-dried or baked bricks is also very rarely found except in the Sabkha areas and oases such as Al Hasa and this is not very suitable because of its high salinity and sometimes high organic content. The construction of buildings in the Eastern Province from local materials, given also the shortage of timber outside the oases, has always been difficult. Therefore, buildings are usually composed of single storey one-room units which can be arranged in various complexes. Today, however, the wealth of limestone provides the basis for cement-making and concrete has become the universal building material.

Lastly, the lithology and geological history of the Eastern Province are associated with some positive aspects of economic geology. Within several of the sediments deposited between the Jurassic and Cretaceous periods hydro-carbons have been trapped, usually in calcareous sandstones capped by relatively impermeable shales in broad anticlines. Southwards from Kuwait to the United Arab Emirates great number of such traps containing oil and natural gas have been found and within the Eastern Province lie some of the largest oil fields in the world. The Dammam Dome, a conspicuous topographical feature was the first oil-field to be discovered and the Shedgum plateau stands over the largest field found to date. This geological fact, together with the closeness of the fields to the Gulf, navigable for even the largest tankers has made possible the economic revolution which has affected the whole of Saudi Arabia and the Eastern Province in particular. A closer examination of the oil industry is made in Chapter 6. In addition and of importance are the anhydrite deposits found in the Cretaceous series none of these are now exploited. These are the most significant geological factors which have influenced development within the Eastern Province and the evolution

of settlements.

The soils of the main cities:

Generally, Dammam , Al-Khobar and Hofuf are founded on sedimentary formations of the tertiary. In Dammam Quaternary sedimentary deposits underly coastal and inland sabkhas. In this area the underground water is high and rises above the ground in the depressions. The main natural soils within the urban area of Dammam are as follows:-

i. predominantly silty sands of Alluvial deposits

ii. alluvia mainly sandy, formed of medium fine sand, in limited flat areas within and around the Dammam City.[9]

In Al-Khobar, the sedimentary rocks, governed by alluvial deposits of the Quaternary, outcrop at the western edge of the town and belong to Dammam formation, of brown and grey dolomite limestone of various types, white marl and grey and brown shale. The natural soils within the urban area of Al-Khobar are mainly as follows:-

i. At the western outskirts of Al-Khobar, there is rock formation, composed of dolomite and prorous limestones.

ii. The matrix of these materials is silty or sandy and the thickness generally varies from 30 cm.to 3cm. or more.

iii. Alluvial deposits consisting of sandy silt.[10]

In Hofuf, the sedimentary rocks are covered by alluvial deposits of the Quaternary Era, but outcrop west of Al-Hofuf; they belong to the Hofuf formation of cream and white sandy limestone with minor calcareous sandstone and shale.

The natural soils in Al-Hofuf are as follows:

i. Cream and white shale.

ii. Sandy silt and clay silty sand of Alluvial origin.

iii. In Hofuf, the cultivated areas are composed mainly of silty clay-like Alluvial deposits containing organic matter.[11]

GEOLOGY, PHYSIOGRAPHY AND SETTLEMENT

The relationship between geological and physiographical factors and urban settlement in the Eastern province is very close, both directly and indirectly.

First, in this arid region the presence or absence of potable groundwater dictate the possibility of human life and activity. As we shall see, the hydrogeology is of vital importance both before and after the coming of desalination techniques to the siting, location and growth of towns.

Secondly, the geological history of this area has made it one of the richest oil bearing areas in the world. It is the presence of petroleum which has brought the urge, the need and the possibility of building new towns and modifying old ones. This urban growth is in turn but the main manifestation of a socio-economic revolution brought by oil.

Thirdly, the geomorphological history of the Eastern province has given it some especial physiographic characteristics, positive and negative from the human point of view. Positively, the high water table basins uncovered by dunes, have provided the largest oasis potential in the Arabian Peninsula; Al Hasa, in particular has been of great importance for millennia. This irrigation potential has long supported urban settlements. Also, positive are the macrolocation effects on settlement of the geological history of the Arabian Gulf. This great marine extension of the Tigris - Euphrates valley, connecting the interior of S.W.Asia with the Indian Ocean, has been a commercially and culturally important routeway for many millennia. On the Arabian shore of the Gulf therefore developed, long before oil, seaports and trading ports large and small. On the negative side however, port development has never been easy. Coral reefs, shifting shoals and a shortage of protected natural harbours have all limited until recently the size and importance of port-cities and have made the building of articial works slow and expensive. Only the growth of oil - wealth and the need for oil exporting facilities have overcome these difficulties.

On the negative side are some aspects of the economic geology. In the Eastern province sedimentary beds there is a completed absence of vein minerals and the dominance of limestones and sandstones laid down under sub humid conditions virtually restricts other economic minerals to some evaporites and the raw material for cement.

Most important however, both in the past and in the present is in the existence between the seaports and oases of the Eastern province and the other regions of Saudi Arabia of a great negative sand desert zone. Physically difficult to cross, this barrier to the interior still only has one important road and one rail routeway connecting Nejd and the Gulf. The costs of overcoming this distance both in capital and current terms are very high. The pull of the Eastern Province to the Gulf has always been strong and oil exploitation has not weakened the individuality of the East - the empty north-south barrier belt towards the interior emphasise the separateness of the East.

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CHAPTER TWO

CLIMATE AND VEGETATION

CLIMATE:

The dry weather, the intense heat of the summer and dry cold in the winter are the characteristics of the desert climate known in the Arabian Peninsula.

i. Summer:- The eastern province in this period is under the influence of two zones of low pressure. The monsoonal low-pressure over India and the Gulf of Oman has an average pressure of slightly less than 1,000 millibars (29.53 inches)[1], this is a permanent feature of the summer months and the strongly developed wind system to which it gives rise affects the whole of the Middle East and India.[2] The other low pressure zone lies over Cyprus, periodically extending eastward to the Arabian Gulf and beyond and becoming more intense. When the Mediterranean low moves east into Southern Iraq, it brings an inflow of warm air into Mesopotamia and heating air to the eastern province from the Arabian Gulf.[3] In July and August, the temperature and the humidity are very high.

ii. Winter:- In fact, most of the Middle East areas are dominated by the high pressures over central Asia, which extend as far south as Iraq and over Turkey. During this period the average pressure along the coast is about 1,018 millibars (30.06 inches).[4] The pressure conditions which affects the Eastern province weather in winter are very variable but one marked effect of the low pressure over the area north of the Arabian Gulf is cold dry north-east winds, particularly on the coasts.[5]

The winter difference between the western part and the eastern part (the eastern province) of Saudi Arabia is particularly marked.

In the western province the winter is influenced by the Atlantic depressions arriving via the Mediterranean and rejuvenated by contact with the sea; thc N.W. air streams are generally warm. In the eastern province during the winter the N.E. winds come from the cold Asian land mass and are composed of cold dry air.

1. Temperature:

In the eastern province there is little effect of altitude or topography on temperatures. The annual mean temperature is about 25.6°C. The mean temperatures during the summer months July and August are 34.9°C and 34.4°C. The temperaturesin winter months January and February are 14.8°C and 16.3°C.[6] The mean monthly temperatures at Dhahran, Abqaiq, Qatif and Hofuf are shown in Table 2.1 and Fig. 2.1 for an average of the three years 1970-72. (The longest period of recorded data.)

TABLE 2.1

MEAN TEMPERATURE IN FOUR STATIONS

Stations	J	F	M	A	M	J	J	A	S	O	N	D
Dhahran	15.3	16.9	20.2	24.8	30.2	33.3	34.9	33.8	30.8	26.6	22.1	15.1
Abqaiq	14.9	16.6	21.5	26.3	32.4	34.9	36.9	35.9	31.8	27.8	22.5	15.2
Hofuf	14.2	15.8	20.2	25.0	30.1	32.6	34.3	33.4	30.7	26.0	21.1	14.6
Qatif	14.6	15.8	19.8	23.9	28.7	31.3	33.6	32.8	30.1	26.3	22.0	15.5

Source:- General Meteorological Department, Jeddah
Hydrology Division, Riyadh.

In Dhahran, about four kilometres from the sea the temperatures have a great daily range during the winter. In February the daily maximum temperatures are from 14.0°C to 30.6°C and the daily minimum from 3.0°C to 18.2°C. In summer the temperatures daily range is somewhat less. In June the daily maximum varies between 35.0°C to 43.4°C and the minimum[7] from 21.6°C to 30.0°C. (See Fig.2.2)

For comparison, temperatures in the Eastern Province and the

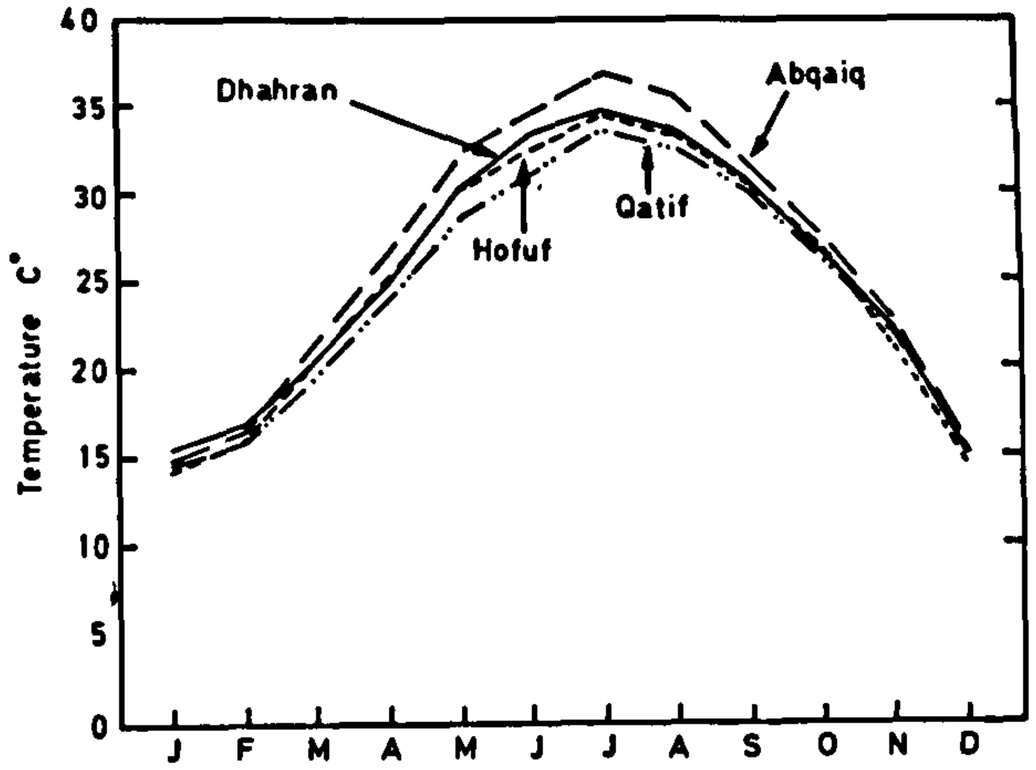

FIG. 2·1. Variation of mean monthly temperatures at selected station in the Eastern province. (1970 - 72)

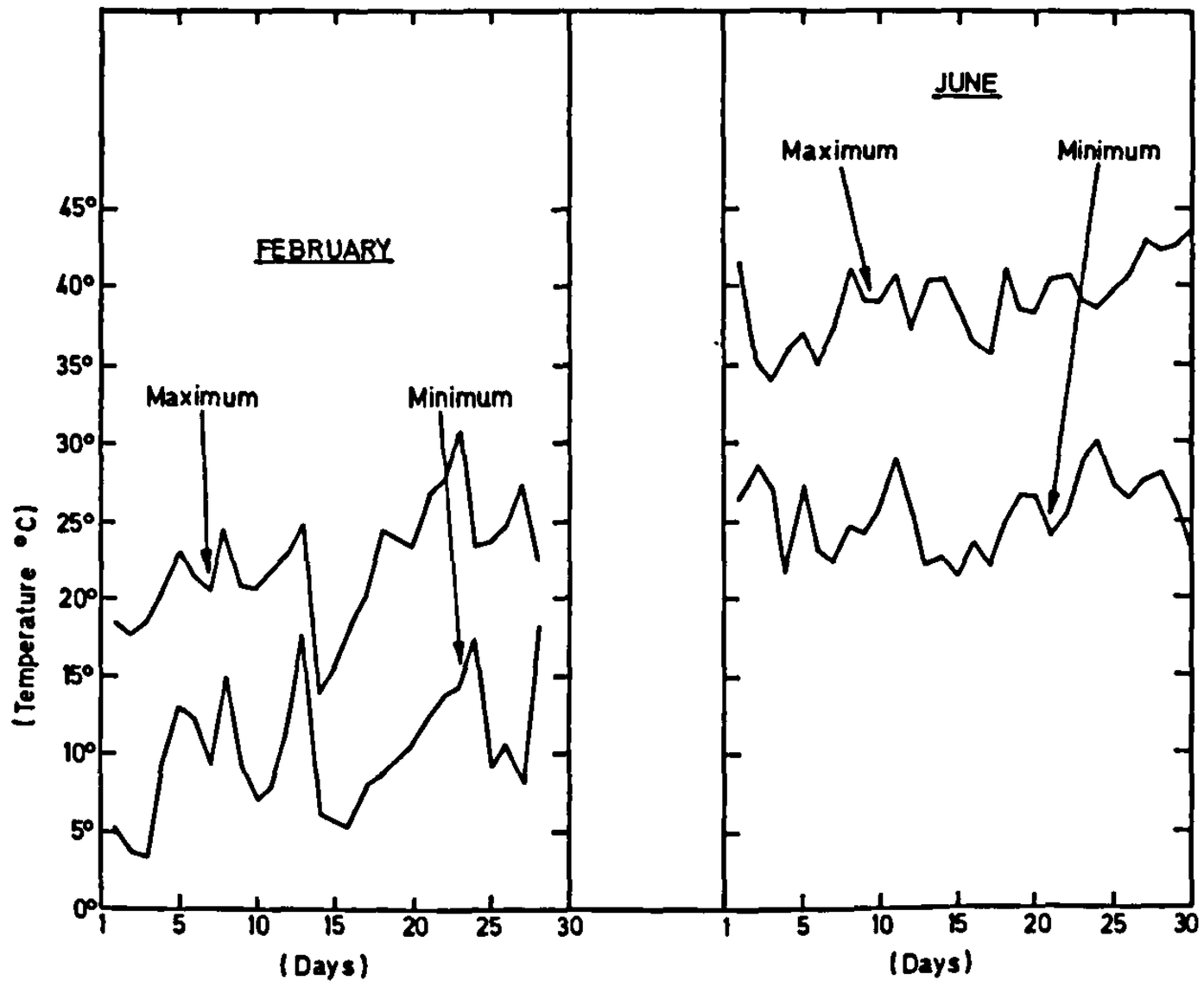

FIG. 2·2. Daily temperature in Dhahran Station.

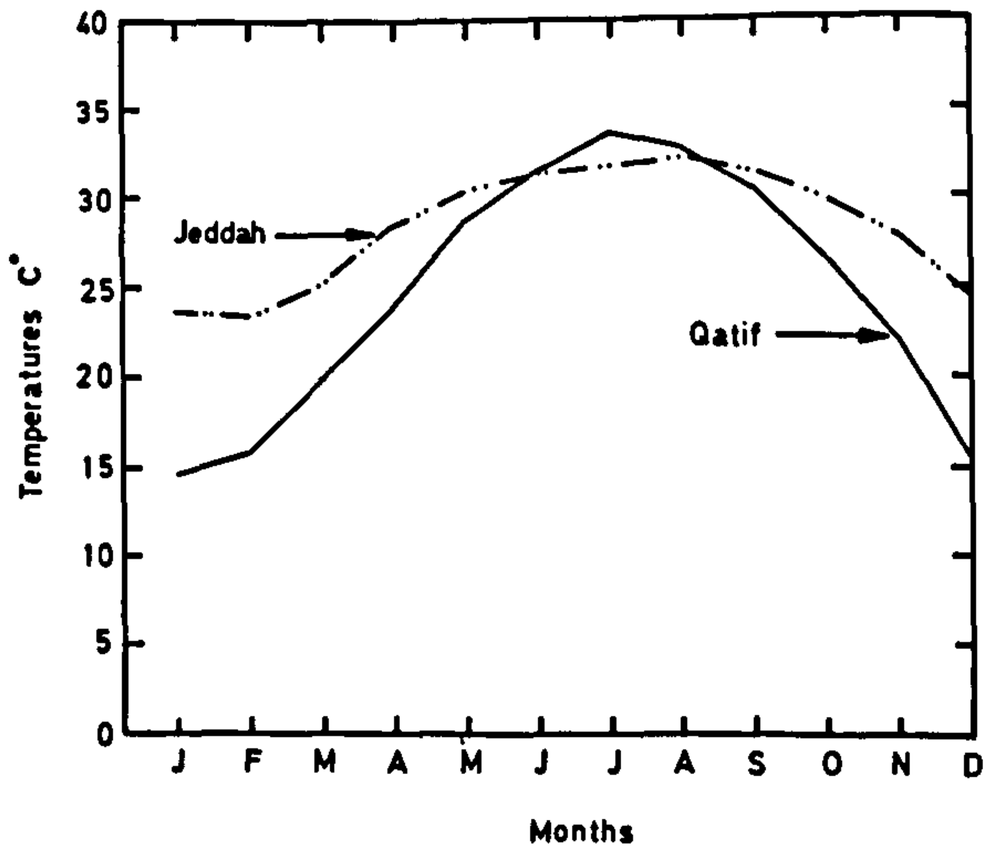

FIG. 2·3. Variation of mean monthly temperatures at Jeddah in the Western province and Qatif in the Eastern province of Saudi Arabia (1970 72)

western province coast are shown in Table 2.2 and Fig. 2.3 - Qatif and Jeddah. The temperatures along the west coast are more equitable, while on the east coast, maximum as well as the daily range of temperatures are usually higher than along the west coast.

TABLE 2.2

MEAN TEMPERATURES AT QATIF AND JEDDAH

Stations	J	F	M	A	M	J	J	A	S	O	N	D
Qatif	14.6	15.8	19.8	23.9	28.7	31.3	33.6	32.8	30.1	26.3	22.0	15.5
Jeddah	23.8	23.3	25.0	28.2	30.1	31.1	31.8	32.1	31.1	29.7	27.9	24.3

Source: General Meteorological Department, Jeddah
Hydrology Division, Riyadh.

The higher minimum temperatures coupled with higher relative humidity account for the greater oppressiveness of climate along the coastal areas than in inland where in general, there is low humidity, and a large fall in the night temperature which gives much relief from the high day-time heat.

2. Relative humidity:

During the summer, (May to August), the relative humidities are generally lower and are higher in the winter. Along the coast the humidity is greater than in the inland areas in both seasons.

In winter the absolute humidity in Dhahran and surrounding areas reaches to 100% during December, January and February. Table 2.3 shows the mean relative humidity at four stations for an average of three years (1970-72)

TABLE 2.3 MEAN RELATIVE HUMIDITY AT FOUR STATIONS

Station	J	F	M	A	M	J	J	A	S	O	N	D
Dhahran	72.0	67.0	63.7	55.3	45.3	33.0	32.3	45.7	57.0	65.0	70.3	69.0
Abqaiq	60.0	52.7	49.0	48.3	34.7	22.7	25.0	29.0	40.3	46.3	55.3	55.7
Hofuf	62.3	49.7	43.0	33.2	29.0	20.7	20.9	27.7	36.5	44.4	50.7	55.7
Qatif	65.0	61.0	56.3	56.3	51.0	40.0	38.3	46.0	54.3	55.6	62.0	59.3

Source: General Meteorological Department, Jeddah
Hydrology Division, Riyadh.

The inland stations such as Hofuf and Abqaiq have the lowest relative humidity from June to August) and Qatif has the highest. In the Eastern Province, the relative humidity within each 24 hours are highest in early morning and lowest in the afternoons at any season of the year.

3. Precipitation:

The rainfall characterized is most of the time by thunderstorms particularly in January, March and April, (see Table 2.4 showing the number of thunderstorms for an average of five years (1968-1972)).

TABLE 2.4 NUMBER OF DAYS BY THUNDERSTORMS AT ONE STATION

Station	J	F	M	A	M	J	J	A	S	O	N	D
Dhahran	2	1	2	2	1	0	0	0	0	0	1	0

Source: General Meteorological Department, Jeddah

Usually the rain does not fall for long in most places but short intense precipitation comes in torrential downpours, causing flash floods, which do considerable damage to homes and cultivated fields. In the Eastern Province, the rain season usually starts in October or November and sometimes in December, and ends in May (see Table 2.5 showing maonthly total of rainfall for an average of five years (1968-1972)).

TABLE 2.5 MONTHLY TOTAL OF RAINFALL AT FOUR STATIONS BY mm

Station	J	F	M	A	M	J	J	A	S	O	N	D
Dhahran	15.5	19.6	8.9	24.9	T	0	0	0	0	3.6	5.0	1.6
Abaqaiq	6.8	31.7	15.4	14.2	0.2	0	0	0	0	0	6.0	3.5
Hofuf	27.5	5.0	10.4	26.8	1.0	0	0	0.3	0	0.3	1.9	2.7
Qatif	18.6	24.4	8.6	15.2	0	0	0	0	0	4.7	8.3	1.9

Source: General Meterological Department, Jeddah (T: Trace = 0.0-5 mm)
Hydrology Division, Riyadh

Throughout the year, the rainfall is concentrated in about seven months from October to May. Dhahran has an average seasonal rainfall of about 11.3 mm.,[9] Abqaiq, 11.1 mm., Hofuf 10.8 mm. and Qatif 11.7 mm.[10] (see Fig.2.4)

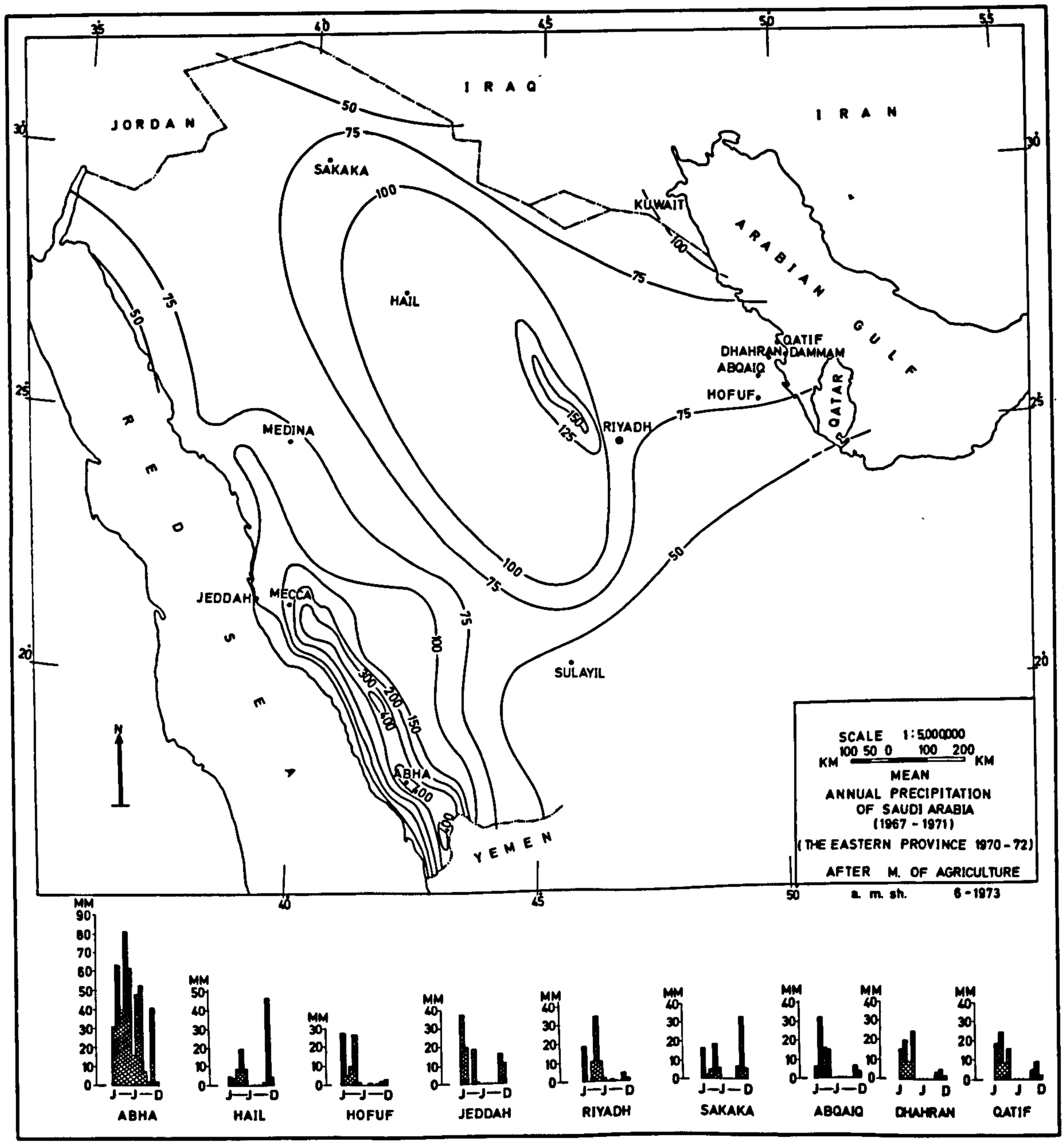

FIG.2.4. ANNUAL RAINFALL OF SAUDI ARABIA.

4. Winds

In general, the winds of Saudi Arabia vary greatly. The Eastern Province is affected by the prevailing winds from the north and the north-west. These winds, locally named Al-Shamalia or Shamal winds, are strong and most persistent during the summer from May to August. Shamal winds frequently whip up sandstorms in their path and bring sand and dust during the summer months. Shamal winds, during the end of the summer, winter and early spring months precede depressions or troughs moving from west and north-west to east and south-east. The southern winds in the eastern province are known as Al-Kaws winds. The sailors of the Gulf call these winds "the enemy"[11] because of the fierce storms they stir up without warning and their high speed reaching up to 40° knots.[12] These winds usually shift to the north-west and from the Shamal blowing dust and sand occasionally in gusts reaching 50° knots. The months of October and November are quiet, with practically clear skies[13] (see Table 2.6 showing the direction and speed of winds in the province for an average of five years (1968-72)).

TABLE 2.6 DIRECTION AND SPEED OF WINDS BY KNOTS AT DHAHRAN STATION

Elements	J	F	M	A	M	J	J	A	S	O	N	D
Prevailing direction	N.S	N.W	N.	N.N.E	N.	N.	N.	N.	N.E.	N.N.E.	N.W	N.W
Mean Speed	9.4	9.2	10.2	10.8	11.6	12.8	12.2	10.4	9.6	8.2	9.0	9.8
Extreme Speed	25.8	23.8	27.2	34.0	27.6	30.6	28.8	29.2	26.0	23.0	21.2	24.8
Direction of extreme speed degree	23.2	20.2	17.4	18.4	27.0	35.0	35.0	28.8	34.8	22.0	25.6	32.2

Source: General Meteorological Department, Jeddah
Hydrology Division, Riyadh.

Throughout the year, whenever the winds blow very strong from the north or the northwest at speed of about 35^{o} - 40^{o} knots,[14] they bring climatically significant dust and sand in suspension (see Table 2.7 showing the number of days on which are the winds blowing dust and sand at Dhahran Station for an average of five years (1968-72)).

TABLE 2.7 NUMBER OF DUSTY AND SANDY DAYS IN EACH MONTH

Element	J	F	M	A	M	J	J	A	S	O	N	D
Days of dust	5	4	4	5	5	11	11	7	3	3	1	2
Days of sand	0	2	1	1	1	1	2	1	0	0	0	0

Source: General Meteorological Department, Jeddah.
Hydrology Division, Riyadh.

In the eastern province, most days have usually very cloudless skies from March to October. If there is cloud, it gives a light cover in average of about two tenths or less and that only for one to five hours or before and after rainfall.

Mist, Fog and Hazeare always found during the night and early morning and never last more than a few hours for some days in each month, and usually clearing by sunrise (see Table 2.8 showing number of days in each month with Mist, Fog, and Haze for an average of five years (1968-72)).

TABLE 2.8 NUMBER OF DAYS WITH MIST, FOG, & HAZE IN EACH MONTH AT DHAHRAN STATION

Element	J	F	M	A	M	J	J	A	S	O	N	D
Clouds	10	7	10	13	6	0	5	2	0	4	7	8
Mist	5	6	4	1	2	1	2	3	8	13	6	4
Fog	2	2	1	0	1	0	0	1	4	8	5	3
Haze	4	7	13	10	14	17	19	15	13	13	3	7

Source: General Meteorological Department, Jeddah.
Hydrology Division, Riyadh.
Statistical Yearbooks Years 1968-72.

The effect of Climate:

The type of climate in the eastern province considerably affects the natural resources, human life, and animals.

The most important connection is through water, required for drinking by people and animals and for irrigation. The availability of water at different times and places is ultimately related to the condition of climate. The few inches or mm. of rainfall at present available every year is not enough to supply water wells in the desert for people and animals living there. Many bedouin have left their homes in the desert and many animals have died of thirst because of the shortage of rain and water in some places. The violence of rare rainfall, coming in floods like a river, results in the erosion of the land surface, removing the soil mantle and damaging plants, roads and dwellings in the urban areas. The periodic damage is so great that some of the small villages and cultivated areas would be better off without any rain.

Temperatures in the desert weather, are very hard, the intensive heat in the summer and the cold dry winter severely affecting the life of man, plant and animals:

1. Man:

i. Locational effect: the summer heat and dry cold weather literally prevents man from living in some parts of the desert, so that hundreds of square kilometers of land have been left lifeless and men are concentrated where the water is.

ii. Effect on housing: almost everywhere in the world the type of man's dwellings are determined by the condition of the weather and climate, choice of materials, design and air conditioning of the structure. Temperature, sunshine, precipitation and winds are the chief elements

requiring attention. In the desert and urban sites of the eastern province all man's dwellings which have been designed relate to the climate conditions, as seen particularly in the structure of traditional houses with mud walls and wood roofs for cooler air, small windows because the sun makes much heat, with a wide court yard in the middle of the house and the orientation of buildings to the coolest winds.

iii. Effect on clothing: light clothes are very common, used against the heat during most of the year and white cotton cloth is the main material used in medium or light weave. In addition the dust and sandy winds in the desert areas during the summer produce a need for a head-covering to protect eyes, ears and nose.

2. Plants:

i. Effects on types of plant: the most obvious effect of climate is to produce the dominance of xerophytic plants. For man however, one response is very important - that of the palm; the eastern province is a famous area for the cultivation of palm trees. The reason is that the palm needs only a small quantity of water in order to supply traditional food and other needs. Plants which need much more water such as rice cannot be grown except in large oases such as al-Hasa, where there is ample groundwater.

ii. Effect on growth: the temperature of the air and of the soil affects plant growth processes since, generally speaking, every variety of every crop plant has minimum, optimum and maximum temperature limits for each of its stages of growth. Those plants most favourably fitted for the eastern province's climate in this way, with the exception of the datepalm and some melons, are not very valuable to man except in that they give low-grade animal pasturage. The date-palms

become of particular importance in oases because their sheltering effect reduces temperature and humidity extremes and allows mixed date-palm and ground-crop cultivation.

3. Animals:

Effect on types of animals: the camel is the main animal for the desert and it is the only one which can live without water for long periods and subsist on the poor desert forage. Sheep and goats are the next most successful but are only important when also supported by oasis water and fodders.

Vegetation:

There is a strong evidence for the close relationship between the pattern of climate and the distribution of vegetation in the eastern province. The shortage of water, which sometimes reaches a deficiency of 40 and 45 ins. in the summer is the main factor, affecting the natural vegetation growth. In such areas like Dhahna Samman, and al-Jafara Sands the moving sand kills off most vegetation. Soil conditions are also adversely affected in terms of plant support by the extreme climatic characteristics of the province.

Man and animals, of course, have done a great deal to alter the pattern of natural vegetation. The exploitation of oil, the wood collection by the bedouin, the bedouin goats and camels, all have made considerable in-roads into the vegetation cover in various parts of the province.

At present, the only vegetation to be found in the eastern province may be classified in two types as follows:-

i. the natural vegetation covering the terrain outside the "island" urban areas, where it is mostly small annual herbs or small

xerophytic shrubs.

ii. the plants in urban areas where man evolved his city and his home as a park and garden.

Nowhere are there true trees or forests, only those plants adopted to the rigorous desert climate as herbs or shrubs, [15] or grown in artificial environments.

The vegetation species are restricted in number as compared to Lebanon and Palestine; in the eastern province the number of native plant species is about 370, while in Lebanon and Palestine there are about 3,500 species. The small number of desert species reflects the difficulties faced by plants in adapting to such a harsh environment.[16] The common plants in the province are quite small in number, usually found as a Sedge (Cyperus Conglomeratus) in the coastal sands; a perennial grass (Panicum Turgidum), and al-Thamam (Panicum Antidatale) found in Qatif and Hofuf areas. The Arfaj shrublet (Rhanterium Epapposum) is dominant over hundreds of square miles further inland and the Rimth saltbush (Haloxylon Salicornicum) cover wide areas of poorly drained soil.[17]

Plants within urban areas are found in the so-called "green" areas, the parks, the gardens and those for special uses, such as the plantation defences for towns and for the farming areas against the dunes' sand. The plants being used for this purpose are the trees which are perennial green and fast growing, such as the Tamarisk (Al-Turfa or Athil). Tamarisk is a very common tree as a defence use from winds or dunes sand. In al-Hasa Oasis, the government has used the Tamarisk as defence for stopping sand movement and more than 3,500,000 trees have been planted covering 1200 acres or about five square kilometers. The other plantation defence against sand is north of Al-Khobar City.

CONCLUSION

Recent development in the eastern province including the growth of new towns and industries or redevelopment or existing urban places requires careful consideration of climatic and hygiene factors. The controlling of the growth of urban places at early stages is important if urban quality of life is to be reasonably high.

Generally speaking, every aquatic or vegetated open space, park or garden can modify city temperatures and humidity, even reduce the amount of dust in the air, a serious problem as noted earlier. The project of sand stabilization is a very good example of the kind of large scale measures required as much by urban settlements as by agricultural. As a result of the province's climate the occurrence of summer sultrines particularly in the coastal area and among the desert (Table 2.1) is high in the months of July and August. The cities of the midland zone are most sultry at noon and in the evening where they are surrounded by desert and have large green areas to stablise the heat and humidity. The traditional dwellings in the oases have intermediate values of sultriness because temperatures and dust are reduced by the palm tree's shade and evapo-transpiration effects on micro-climate

The midland area of the eastern province includes the main urban centres, industrial plants, workshops, sea port, air port, railway etc. and should be carefully studied in terms of climate before there is further housing and industrial expansion.

Firstly, solar radiation and illumination are very high in the province over the days of the year (Table 2.10) and the urban planners can control the amount of sunshine by the width of windows, the orientation of buildings and width of the streets. In the eastern province many modern houses have large glass front windows, which increase the heat build up inside the house through insulation and in turn create a longer demand for air conditioning.

Secondly, radiant temperature rises in urban places where it is produced by the greater heat absorption and storage in the open areas within the towns as well as in the surrounding desert. It is very clear that green areas are required near and within the urban, to filter the air from the air pollution and stabilise heat and humidity changes.

Thirdly, wind effects can severely affect urbans and rural settlement (see chapter 3 p.53). Strong hot and drying winds cause deterioration of many materials such as wood and produce extreme discomfort to human beings here as with the "red wind" of California. Furthermore, the strength of winds results in the picking up of heavy loads of silt and sand. Any open soil or sand surface, an unpaved street or unused plot is the source of major irritants to the human body, general dirt pollution everywhere and even traffic hazards and the blocking of stormwater drains etc. There is at the moment a striking contrast between the quality of life as expressed in new houses and offices and that found in the sand and dust polluted general urban environment.

Architecture and building materials have changed considerably. The traditional house was constructed usually from local materials, roughstone, some mudbrick and date-palm timber although some imported timber was used for doors and window frames. The design, as in all arid areas of high temperature, was based on the need to minimise insolation heating and the wind blowing of sand and dust into the house. At the same time relatively cool air from north-west winds was encouraged to enter the house if this could be achieved without letting in sand and dust. The loss of heat during winter nights in particular also had to be minimised. Traditional buildings therefore had thick walls and windows (smallest in the interior, largest on the coast) facing away from local sand carrying winds; wind towers and scoops of the types known in Kuwait, Dubai and Iran were not built. The roof would also be as thick as the strength of timber beams would allow and flat and stong enough to allow them to be used for lining space.

Oil wealth which has enabled urban growth also raises incomes it has made possible the creation of articifical environments for human living; air-conditioning, deslainated water-supply, electricity, etc., have now made, for most of the province's population, the facts of climate much less significant. As appears from the Tables indicating types of house construction (Tables 8.4, 8.23,8.37 and 8.55) and those showing the great predominance of domestic consumption of electricity (Tables 5,21 and 5.22).

The daily temperature regime has also resulted in the slackening of all human activity for several hours after noon and the appearance of peaks of activity before and after this slack period. This is illustrated very clearly in the daily variation in traffic flows (see Chapter 7 pp.198-200)

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CHAPTER THREE

AGRICULTURE, LIVESTOCK, WATER AND MARINE RESOURCES

A. Agriculture

Today, agriculture and water resources in the Eastern Province still maintain great value in the economy of the province, in spite of the coming of the oil industry, and the effect of that industry on the agricultural economy as the main source of income for the region.

Taking a general view of the agricultural conditions throughout history, it would appear that during the past the agricultural areas have been reduced by sand cover. The cultivated areas at the Oases of Al-Hasa and Qatif were originally joined together, but increased aridity and sand movement destroyed the intervening cultivated areas. There is plenty of evidence to support this conclusion; a few miles west of Al-Uqair there are a number of palm gardens which are even now being buried under the sands. Also, further inland, there are groups of water wells which are now abandoned. In the Oasis of Al-Qatif, to the west of Qatif city and to the north and north-west of Safwa town, lie the remains of a former extensive cultivation, in addition to the ruins of canals and dwelling places all along the western edge of the Oasis.[1]

However, agriculture was one of the most important occupations in the Eastern Province prior to the discovery of oil, and was the main source of income and the economic basis of the region. The main crops were dates, alfalfa and a limited number of vegetables.

The following survey is designed to illustrate further aspects of the physical environment of the Eastern Province and also to indicate the rural factors affecting the nature of the settlements in

the Eastern province. As will appear here and in later chapters, settlements which are dependent on agriculture and rural activity are considerably influenced by the opportunities and limitations offered by the physical environment and human reactions to them.

1. - Farmland: Farmland was the traditional basic source of wealth, and the acquisition of land was desired by people of influence as a source of income, and a matter of pride of possession. Cultivation is limited to two areas, Al-Hasa and Qatif Oases. These comprise about 2.6% of the total land area in the Eastern Province; the defined area for agricultural land is about 133557 Donum (in 1970 - 1971) as opposed to about 126136 Donum in 1960 (see Table 3.1)

TABLE 3.1 AGRICULTURAL AREA IN THE EASTERN PROVINCE (in donums)

Element	1970-71	1960	%Increase
All province	133557	126136	5.9
Al-Hasa	80000	75587	5.8
Al-Qatif	53556	50550	5.9

Source:- Ministry of Agriculture and Water, Statistical Year Book, 1965.

The percentage increase in the agricultural area over the ten year period is not much, but there are hopes that the recent improvement in the farmlands of the province will continue.

(i) Types of tenure:-

The type of farmland tenure in the Eastern Province is characterized by the small number of rented areas. Only 18.6% of the total area of agricultural land is rented, the remainder being farmed by the owners. Most of the areas which are tenanted were only rented because the owner did not get a sufficient return from his land to justify making capital improvements, or because he did not wish to work in the agricultural field. Rents are normally operated on a

short-term basis of one year so interest in improving the land and its facilities is lacking in both owner and tenant.[2]

In Al-Qatif Oasis, the land farmed by its owners is about 90.0% more than in Al-Hasa, and comprises 75.6%[3] of the total farm land (see Table 3.2).

TABLE 3.2 TYPE OF FARMLAND TENURE IN DONUM (1960)

Element:	Owned:	%	Rented	%	Total	%
All Province	102653	81.4	23483	18.6	126136	100
Al-Hasa	57134	75.6	18452	24.4	75587	59.9
Al-Qatif	45519	90.0	5031	10.0	50550	40.1

Source: Statistical Yearbook, 1965.

(ii) Farm Size

In the land tenure system, the agricultural areas are characterized by small owner-operated farms, with an average area of 13.9 Donum per holding. About 70.7% of the total number of farms are smaller owner-operated units with an average from 5-10 Donum,[4] comprising about 34.3% of the total farm area. The remaining farm areas are distributed amongst the larger sized farms which account for only 29.3% of the total farm area .

The small and medium sized farms are almost all privately owned, and farmed by their owners. The farmer runs his holdings on his own behalf, with government help when necessary.

One immediate point which can be made here is that farms of this size cannot support a wealthy agricultural population with obvious consequences for the market and service towns of the rural areas.

iii. Area under cultivation:

The cultivated land in the Eastern Province covers approximately 80.5% of the total agricultural areas. In Al-Hasa Oasis, the cultivated land is about 49.8%, and in Qatif Oasis it is 30.7% of the total agricultural land in the Province.[5] (see Table 3.3, showing the cultivated and non-cultivated areas)

TABLE 3.3 CULTIVATED AND NON-CULTIVATED AREAS OF FARMLAND IN DONUMS (1960)

Area:	Cultivated:	%	Non-Cultivated	%
All Province	101593	80.5	24543	19.5
Al-Hasa	62801	49.8 of total	12785	10.2 of total
Al Qatif	38792	30.7 of total	11758	9.3 of total

Source: Statistical Yearbook (1965)

There is 1.4 Donum of cultivated area per person in agriculturally dependent families, whereas there is only o.25 Donum per person of the total population of the Eastern Province.

2. Irrigation:

Most of the cultivated land is irrigated by springs and wells, very few areas being fed by rain and these mostly being located outside the Oases. Irrigation is done by diverting water, by gravity, from artesian springs through the canals to the fields, and also from mechanized pump wells into irrigation ditches running along the sides of the fields. When the fields have absorbed all the water, at specified times the farmer allows the surplus water to drain into secondary canals which lead the water to a lower field. This is a very primitive system of irrigation as the saline content of the water increases as it passes through each field. The remaining water is allowed to evaporate, forming what are known as Sabakha (salt flat areas) at the far end of the cultivated areas.[6] The abundance of water, the too-salty soil and the primitive system of irrigation are spoilingthe cultivated land, and the farmlands are shrinking in both Oases.

At Al-Hasa oasis the government has planned for a new system of irrigation and drainage. The artesian water which appears on the surface gives life to the people living in Al-Hasa, and in addition transforms the country into an ocean of green palm trees.[7] These palm trees traditionally dominated the irrigation system. The new irrigation system enables high lands to be irrigated, excess water drained, salinity removed, and some wells locked up for the conservation of water to be used at a future date. The new system will increase the area available for cultivation from 80,000 to 200,000 Donum. The project, begun in May 1967 and completed in December 1971, cost approximately S.R.235,000,000 (52,000,000 Dollars). Only 36 of the old water wells have been used in this project, and the overall length of the concrete canals being used in the project for irrigation is 1624 Km (1,000 miles). (see Fig.3.1)

The problem of irrigation at Qatif oasis was similar to that in Al-Hasa. The poor system of gravity irrigation and drainage, which allowed no control over the use of water and digging of wells was the only method used. This resulted in increased salinity of soil, the decrease in crop production to about 25% and the shrinking of cultivation areas by marshlands. For these reasons, the government gave serious consideration to a new irrigation and drainage system. In 1955, the project was studied and planned by the Oil Company (Aramco) and was planned to be carried out in 1960-64. (see Fig.3.2)

The project consists of 43849 metres of irrigation canals and 29770 metres of drainage canals, running through cultivated areas and covering approximately 40400 Donum (10000 acres).

Fig 3.1 IRRIGATION AND DRAINAGE SYSTEMS IN AL-HASA OASIS

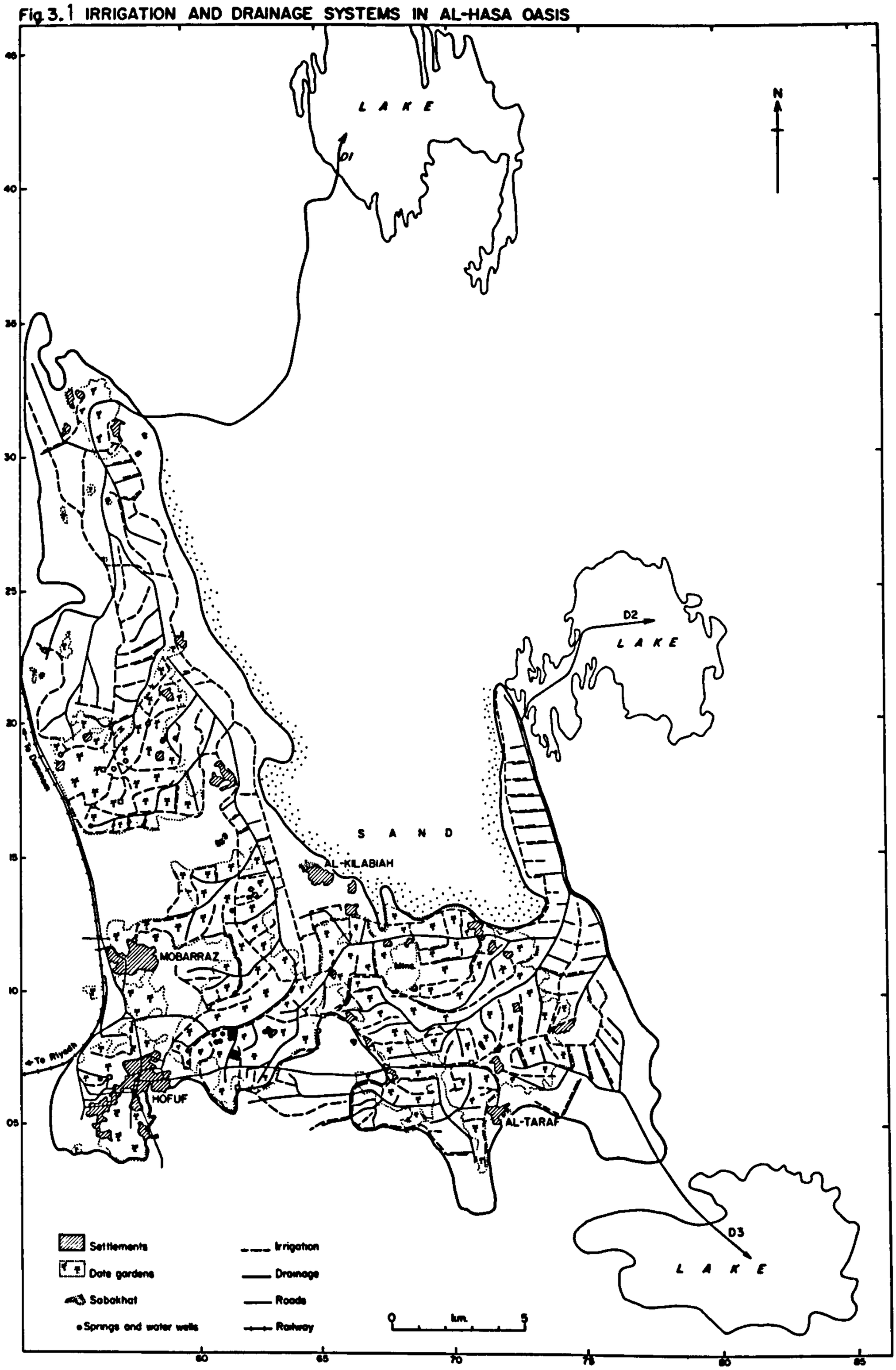
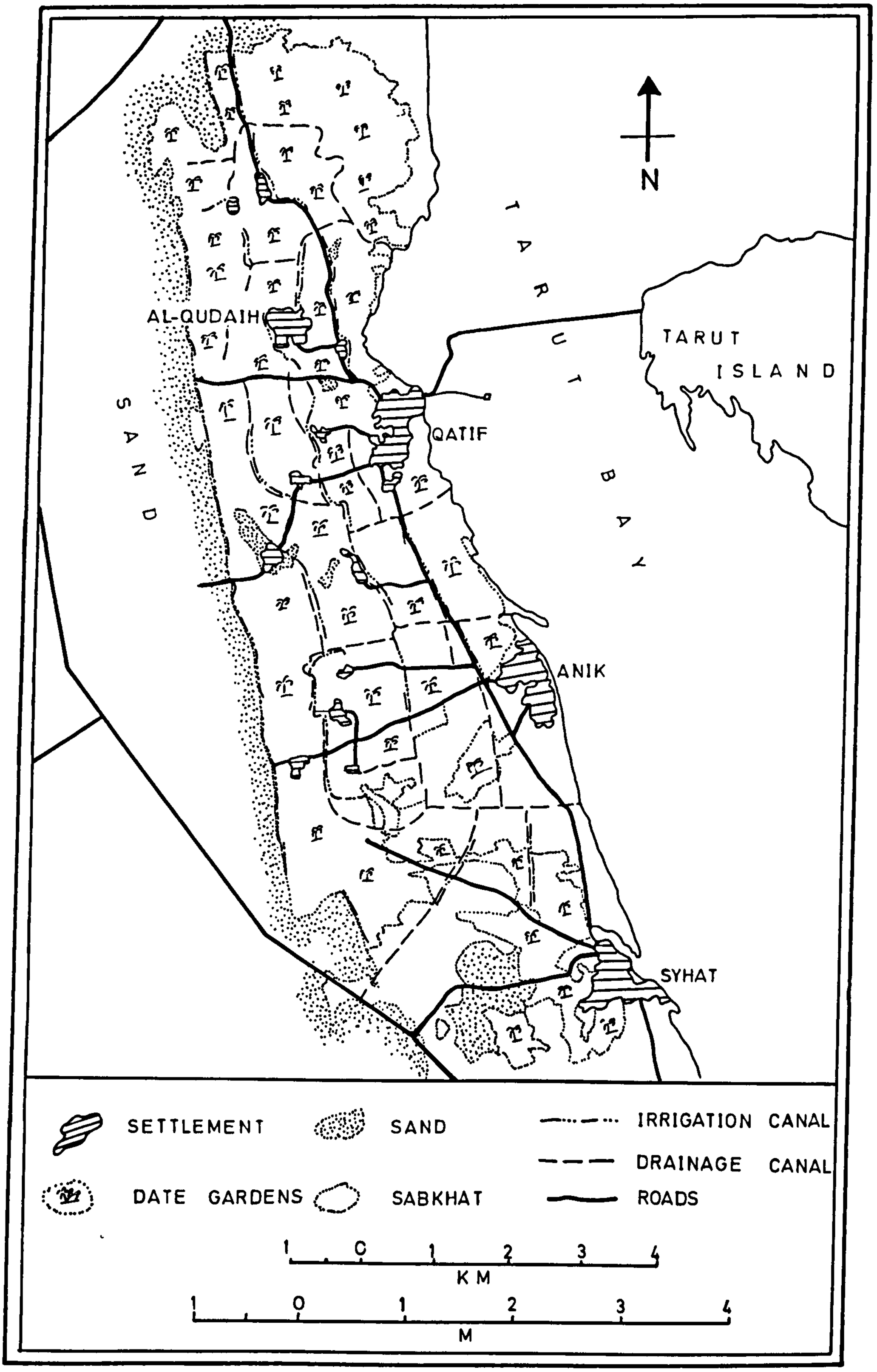


FIG. 3.2 IRRIGATION AND DRAINAGE SYSTEM IN QATIF OASIS.



Even from this summary statement it is clear that very considerable investment in the agricultural areas of the Eastern province is being made by the State. This again is influencing the scale of activity in urban and other settlements (see Chapter 8).

3. Soil

The main soil types in the Eastern Province are derived from sedimentary limestone, sand, loam and clay. They contain a relatively large proportion of salt as the result of the primitive irrigation and drainage methods used at the Oases farmlands. The soil outside the Oases is almost all sand, and so is left uncultivated. The two Oases, with some additional areas such as Yabreen Oasis South, Al-Sirar and Al-Jubail North, have medium quality loam and sandy loam soils and in some parts can be used for the production of selected crops.

4. Production of Crops

The main crop is dates, and palm trees occupy 44.2% of the farm land in both Oases. The remaining land is used for a variety of crops e.g.vegetables and fruits. The cultivated area comprises 88.4% for permanent crops, the remaining 11.6% being used for temporary crops.

Generally, the crops produced are not sufficient for the needs of the region, in spite of government efforts to increase production by bringing in crops with new proven methods to the area. Fruits, vegetables, cereals and many other foodstuffs still have to be imported to supply the towns because of increasing propulation.

i. Dates

Date palms in both Oases give an important subsistence crop for the Bedouins and the townspeople, both as a special and a staple food. In the Eastern Province the date gardens are almost all found in holdings of less than 50 Donum. In recent years, with an increase in regional and national prosperity, the date crops in general have become

relatively less valuable as compared with other crops; the evidence is that the number of palm trees has decreased over the past few years. In 1960 there were 3,222,291 trees, whilst ten years later the number had fallen by about 44%; in 1970-1971, there were only about 1,805,210 trees in the whole province. The reasons for this decline are as follows:

(a) the date crop was no longer the main food for the population; the lifestyle of the people had changed, they looked to new foods

(b) farmers look to market requirements and to what brings them the highest income; the dates, which were almost all marketed locally as fresh dates, brought only a low income compared to that obtained from other main crops (see Table 3.4), showing the annual income per Donum).

TABLE 3.4 ANNUAL INCOME PER DONUM FOR 1970-1971 IN S.R.

Vegetables:	Alfalfa:	Dates:
1671	981	501

Source: Aramco

The Ministry of Agriculture Survey of 1970-71 showed that only 77.2% of palm trees are productive, with an annual production of about 41.0 Kg.per tree. The average number of palm trees in each Donum is about 31, and the average production for each Donum is 982 KG. The production of the palm tree is not high compared with other regions in Saudi Arabia, although the total production of dates in the province is is higher than in other regions; this is due to the greater number of palm trees in the province. The absolute dominance of the date palm in the oases is over, both an indication of change and the cause of further changes.

ii. Vegetables

The vegetable crops at present are important, and consumption has increased with the growth in population. The main vegetable consumption areas are Dammam, Al-Khobar and Dhahran. Aramco Company has also purchased vegetables for its supermarkets and restaurants in the Aramco quarters. This creates a demand for vegetables and expansion has taken place primarily in the traditional agricultural areas, where the Ministry of Agriculture and Water helps the farmers plant vegetables in different crop rotations. The changing face of agriculture has been so successful in the growing of vegetables and fruits, that it can now cater for the demands of the local markets in the province.

The areas used for vegetable growing in the Eastern Province in 1960[8] totalled 9133 donums and this increased by almost 77.0% by 1970.[9] The areas under vegetables in Al-Hasa Oasis are greater than in Qatif, due to the larger agricultural area and the difference between the two Oases is very marked in 1970-71 (see Table 3.5).

TABLE 3.5 VEGETABLE PRODUCTION BY DONUM

	1960	1970-71	Increase	%
All the Province	9133	16160	7027	76.9
Al-Hasa	4622	10100	5478	118.5
Al-Qatif	4511	6060	1549	34.3

Source: M.of Agriulture and Water Resources.
Aramco.

However, the area under vegetables in the province made up only some 3.1% of the total vegetable area in Saudi Arabia.

The average annual production of vegetables in the Eastern Province is about 2,400 Kg.[10] per Donum.. Information to hand is only for certain crops, e.g. tomatoes, eggplant, onion, squash, water and sweet melons (See Table 3.6), although okra and other crops are grown for sale and domestic consumption.

Obviously, the vegetables are not produced in sufficient quantities to supply the whole population for all the year round. When computed, the average annual production (of 2,400 Kg.per Donum) gives only 51 Kg

TABLE 3.6 ANNUAL PRODUCTION OF SOME VEGETABLE CROPS (1970-71)

Vegetable:	Production in Kg.	Kg.per Donum.	Kg.per person
Tomatoes	1,130,000	780	2.6
Eggplant	1,604,000	836	3.7
Dry Onion	1,712,000	3370	4.0
Squash	128,000	132	0.3
Water Melon	260,000	1494	0.6
Sweet Melon	313,000	2566	0.7

Source: Ministry of Agriculture and Water.

per annum per person in the Eastern Province. This production probably covers the local markets for only a few months, the remainder being covered by importing those crops with a high rate of demand. The increase in demand for vegetables in the Eastern Province has grown constantly over the years between 1964-1968. In 1964, tomato consumption was estimated at 88,000Kg per month, and in 1968 this increased to 265,000Kg per month; also the consumption of lettuce increased from 68,000 Kg per month to 112,000 KG per month over the same period (see Table 3.7 showing the increased demand for vegetables in the Eastern Province.)

TABLE 3.7 INCREASED DEMAND FOR SOME VEGETABLE CROPS (1964-1968)

Crop:	1964	1965	1966	1967	1968
Tomatoes	88,000	-	186000	220000	265000
Lettuce	68,000	82,000	87000	97000	112000
Eggplant	13,000	14,000	19000	46000	66000
Carrots	31,000	31000	34000	54000	59000
Squash	5,000	15000	28000	38000	45000
Cabbages	21,000	24000	20000	30000	30000
Cauliflowers	11,000	14000	13000	19000	34000
Sweet Corn	4,000	4000	6000	6000	8000

Source: S.Labban, "Vegetable Cultivation in the Eastern Province"

iii. Fruits

Fruit is next in order of importance to vegetables, demand also having greatly increased. Production is usually for the consumption of local markets, but the same situation as for vegetables pertains here, a considerable quantity of most fruits being imported because the local production is not sufficient for the demands of the people. Fruit trees are cultivated in the same areas as palm trees, and it is therefore not possible to separate out the total area of fruit cultivation. The total number of fruit trees in 1960 was approximately 537800 (about thirteen varieties). The main crops are grapes, pomegranates, plums, apricots, oranges and lemons.

Many kinds of fruits have been introduced as new crops in the Eastern Province not only to supply the growing provincial urban population but also the country. The Ministry of Agriculture has encouraged the farmers to plant new crops, and Aramco also made extensive studies with some crops. In October 1966 an attempt was made to establish a citrus grove on the Qatif project farm, by planting five types of budded

rootstock imported from the U.S.A. This attempt, and also many others, were successful, but some other attempts to increase the variety and number of fruits produced have been disappointing, not only in Qatif but also in Al-Hasa. However, the number of fruit trees in the province was regionally the highest (about 33.5% of the total) in Saudi Arabia (see Table 3.8).

TABLE 3.8 NUMBER OF FRUIT TREES IN SEVERAL REGIONS (1960)

Region:	No.of trees:	%
E.Region	537,823	33.5
Midland Region	402,100	25.1
Jedda/Mecca R.	22,700	1.4
Medina Region	101,600	6.3
Taif R.	206,600	12.9
Qassim R	176,400	11.0
N.Region	156,700	9.8
Total	603,923	100.0

Source: Ministry of Agriculture and Water, Statistical Yearbook, (1965)

iv. Field Crops

Field crops in general still have very small areas of production, due to the small amount of land cultivated and to the primitive production methods and crop rotation systems. The only data on hand for 1960, is for four crops, Alfalfa, millet, rice and hinna. About 62.7% [11] of the field crops area is cropped with alfalfa. This is due to the ease with which this crop can be planted, and its capacity to grow everywhere, under the date palms as well as in separate fields. Alfalfa is grown perennially in almost all the oases, and is very valuable to the farmer for its high price and also as a forage crop for the livestock.

The other field crops which occupy the remaining areas, account for about 37.3% of that (see Table 3.9).

TABLE 3.9 AREAS OF FIELD CROPS (1960) BY DONUM

Crop:	All province		Al-Hasa		Qatif	
	Area	%	Area	%	Area	%
Rice	7786	33.2	7851	41.0	35	0.8
Millet	889	3.8	-	-	889	19.7
Alfalfa	14835	62.7	11318	59.0	3517	78.1
Hinna	64	0.3	-	-	64	1.4
Total	23674	100.0	19169	100.0	4505	100.0

Source: Ministry of Agriculture and Water

B. Livestock

Since the vegetation of the Eastern Province is very sparse and extremely arid and semi-arid desert conditions prevail, the livestock carrying capacity of pasture land is very low; low enough to force a pattern of nomadism on pastoralists. Only in the irrigated oases can fodder production give an alternative basis for livestock. These facts and the spatial networks of trading contact are of considerable importance to the understanding of the settlement geography of the Eastern Province.

Domesticated livestock farming is of three types according to the conditions in which the stock lives and is kept.

(i) Animals belonging to the nomads and semi-nomads in the desert,are reliant on permanent watering places near villages or regular migration in search of pasture and grazing areas. Some fodder is involved since the Bedouins often feed their animals hay which they grow on the semi-desert in the rainy season and keep for the dry seasons, but the desert ranges and nomadism are dominant.

(ii) Animals on the farms of the oases, feeding on alfalfa, grasses and other green fodder and grazing on the nearby pastures; this is settled livestock farming.

(iii)Animals in urban areas, usually kept in the homes of the people, for the supply of milk. These animals are fed on alfalfa, dried or green grass and barley and form an extension of agriculture into the urban scene, strongest in the oldest towns.

Overall, there is no available data for the number of animals of each type, but the number of animals within urban areas has certainly decreased over the last few years. The only available date for numbers of domesticated animals in the province are for 1960 and show approximately 54,606 head in total, 41.0% of them in Al-Hasa and 59.0% in Al-Qatif. These numbers also cover camels, cattle, donkeys, horses, sheep and goats. The highest percentages were goats (about 36.9%) and sheep (33.4%). (See Table 3.10).

TABLE 3.10 ANIMAL VARIETIES IN THE PROVINCE (1960)

Variety	All Provinces	%	Al-Hasa	%	Qatif	%
Camels	1565	2.9	297	0.5	1268	2.3
Cattle	8296	15.2	6036	11.1	2260	4.1
Donkeys	6169	11.3	4616	8.5	1553	2.8
Horses	150	0.3	9	0.02	141	0.3
Sheep	18257	33.4	4389	8.0	13868	25.4
Goats	20169	36.9	7025	12.9	13144	24.1
Totals	54606	100	22372	41.0	32234	59.0

Source: Statistical Yearbook (1965)

The number of camels in Al-Hasa is much lower than in Qatif Oasis aboslutely and proportionately. The camels, all of the one hump variety, are the universally recognised symbol of the desert life of Arabia in the past, and still play an important role in the economy of the nomads.

As the Bedouins use their camels in the desert, so do the farmers use their donkeys for all work and movement within the oases. Many years ago the donkey played a much more important role in the farm life, and the same is true to a lesser extent today. The people of Al-Hasa use their donkeys much more than in Qatif. Al-Hasa formerly had about 74.8% and Qatif 25.2% of the total number of donkeys in the Eastern Province.

Sheep and goats are also of prime importance in the province for their economic use and also for the provision of meat for the local markets. Sheep bred are generally of the ordinary fat-tailed variety, and they provide the bulk of the meat supply. Sheep and goats are kept mostly by the Bedouins and partly by the farmers, and account for about 70.4% of the total number of animals in the province. In spite of this they are not bred in sufficient numbers to supply the demands of the province's meat markets. When considering the number of sheep and goats alongside the total number of people in the province, it is found that there are approximately 0.1 sheep or goats per person.

Cattle are of the humped variety, kept by farmers for milking or other purposes. In addition there are a few kept by city and town dwellers for their milk supply, and these are mainly fed on green alfalfa and other fodder grasses. The total number of animals in the Eastern Province is not high compared with other regions in Saudi Arabia such as the Qassim and Midland Regions.

The number of animals in the Eastern Province is not sufficient to cater for the demands of its meat markets; only 30% of the annual requirements of the province are supplied locally. The daily average need is approximately 388 head of sheep, goats, cattle and camels, while the average number of local animals daily supplying the meat market is about 115 head, the remainder being imported animals (See

Table 3.11 showing the actual number of local and imported animals killed under the supervision of the municipalities in the province for three years, 1967-8, to 1969-70 (1387-89AH).

TABLE 3.11 NUMBER OF LOCAL AND IMPORTED ANIMALS KILLED FOR MEAT MARKETS

Year	Local	%	Imported	%	Total
1967-68	41,984	31.1	93,037	68.9	135,021
1968-69	37,452	25.1	111,594	74.9	149,046
1969-70	35,509	27.5	93,720	72.5	129,229

Source: Municipalities Department, Ministry of the Interior

The meat markets of the newly expanded cities and towns (Dammam, Al-Khobar, Dhahran, Rihaimah and Abqaiq) provide an average of about 58.6% of the total animals killed annually in the province. The remaining markets provide 41.4% including Hofuf and Qatif cities.

More than 70.0% of the meat supply in the newly expanded areas comes from imported meat, and this percentage seems to be increasing and the meat supplied by local animals has been decreasing (See Table 3.12 showing the annual number and percentage of animals killed in the newly expanded areas over three years).

TABLE 3.12 ANNUAL NUMBERS OF ANIMALS KILLED IN NEWLY EXPANDED AREAS

Year	Local	%	Imported	%	Total
1967-68	18,173	22.0	64,429	78.0	82,602
1968-69	5,183	6.5	74,523	92.3	79,706
1969-70	14,941	18.6	64,072	81.1	79,013

Source: Municipalities Department, Ministry of Interior.

The decrease in the number of local animals available is probably due to the movement of the younger Bedouins into the cities, resulting in a drop in the number of animals kept.

Poultry and Small Livestock

Efficiently organised poultry farms are found in Dammam and Al-Khobar, and also all the farmers keep some kind of small livestock such as chickens, geese, ducks, pigeons, rabbits and turkeys. All these have been raised, particularly at the farm areas, but there are no recent figures for poultry. The available data comes from the Agricultural Survey of 1960, which gave a total of poultry in the Eastern Province of about 24.1% of the whole of Saudi Arabia.

Most important are chickens - about 85.8%, and rabbits - about 7.1% of the total numbers of poultry in the province. In general Al-Hasa Oasis has more poultry (about 66.3%) than Qatif Oasis (33.7%) of the total poultry in the Province.[12]

C. Water Resources

The rainfall is not sufficient for agriculture, but the Eastern Province is famous for its abundance of water flowing from springs.

There are two types of water resources in the Eastern Province:

(i) Surface Water

(ii) Ground Water

(i) Surface Water Resources are mainly supplied by the rare flash floods which run off on the ground surface, lasting from half an hour to several hours or days, some of which may be lost by infiltration further down in the ground.

(ii) Ground Water is found down-dip in sedimentary formations which supply almost all the spring water in both oases. The formations, as they approach the Arabian Gulf along the line Qatif-Al-Hasa-Yabrin, run in a north-south direction, which touches the coast at Qatif.

In the Eastern Province the aquifers rise closer to the surface as they approach the coast of the Gulf. There are in fact seepages where considerable quantities of relatively fresh water issue at the surface only to be dissipated in the Sabakha or by evaporation. The water wells

wells in the coastal area are easily accessible with aquifers very near the surfaces, but this is partly offset by the poorer quality of the ground water.[17] The depth of these surface water wells in the Eastern Province is usually from 3m. in the coastal areas to 60m. or more in the interior.

The submarine springs under the water of the Arabian Gulf and at Bahrain and Qatar also belong to these sedimentary formations. The combined yield of the numerous springs at Al-Hasa has been measured and yields an average of 12.5 cubic metres per second.

At Al-Hasa the water for irrigation and drinking is obtained from the artesian beds, through hand-dug wells and from the springs' natural fissures which are largely free-flowing ('Ains). The number is estimated at about 63 springs for the whole of the Oasis, the main 'Ains having an estimated total discharge of more than 150,000 gallons per minute. The water supply in Al-Hasa Oasis comes mostly from these springs, and also from the few drilled artesian wells. Depth varies considerably from 150-200 m.for the springs, and from 5-9 m. for the wells.[18]

The water in Qatif is obtained from 15 springs and 150 wells.[19] The main large springs are Darwish, Rubainah, Al-Maharig, Al-Hammam, Al-Qasari, Marwania and Al-Dibaibiah. Their depth varies from 150-280 m. for the springs and from about 12-60 m.for the wells. The estimated discharge is about 1132 gallons per minute.[20]

(i) Artesian Wells - the water supply for Dammam, Al-Khobar and Dhahran comes mainly from artesian wells, discharging directly into the new water distribution system. The depth of these wells ranges from 40-150 metres. There are 5 wells supplying Dammam, ranging in depth from 100-140 metres; the daily total discharge is about 23,000 cubic metres. Al-Khobar is supplied from 3 wells at depths of 140 metres.[21] Dhahran is supplied from 18 wells at depths from 50-133 metres; Ras Tannura's supply comes from 21, Abqaiq's from 6 and Shudgam's from 7 wells.[22] In addition there

are 52 wells in Haradh (Faisal Project). The variety of depth in these water wells depends on the ground elevation required to the top of the aquifer.

(ii) Water Desalination: because of recent large urban growth total water demand has increased so making necessary this supply of drinkable water, mainly for the coastal area. Such water might also be used for industry or manufacturers who support the high costs involved. The desalinisation plant in Al-Khobar has a daily output of 7,500,000 gallons, supplying Al-Khobar, Dammam, Dhahran, Qatif and Safwa. Also the desalinisation plant in Al-Jubail further north of Al-Qatif will have a daily capacity of 120,000 gallons; this contract was signed in August 1973.[23]

D. Marine Resources

The Arabian Gulf is rich in marine resources which have been traditionally exploited by the small fishermen in the Eastern Province, and these resources are of considerable significance to the nature and location of several settlements. The fisheries supply, handle and distribute the fish catches to local markets on a highly seasonal basis. The amount of fish landed could be increased to provide an additional food supply for the province, and also provide the basis for a lucrative industrialised fishing industry. The Qsyaibi shrimp canning factory in Dammam is a good example; its products are consumed locally, and also exported to American and Japanese markets. The new economic status of the province could create growing and varied demands on several marine resources, but the inadequate marketing and necessary facilities for preservation and transportation on a large scale would have to be improved to encourage the expansion of the fishing industry. At present, most of the fish and seafood are still consumed fresh within the province.

Marine life in the Gulf includes a range of fish and reptiles. More than 200 species of fish are found in the waters of the Gulf and small fishing villages have been traditionally of some importance along the coast. The useful species include sardine and mullet (Powry) which are caught in large numbers; also the grouper (Hamur and Subayti) king mackerel (Kanad), Samfish (Sayyafi) and tuna (Jihabah). Small freshwater fish are found in the spring ponds of Qatif and Al-Hasa Oases.

The most important and widely public marine activity of the Arabian Gulf is pearl fishing, and for many years the Gulf Waters have yielded some of the finest pearls in the world. The pearl was the economic base of the region up to 1946, when the price of pearls declined. The pearl industry was flourishing until 1931, but with the appearance of Japanese cultured pearls, which first came on to

the market in commercial quantities in the 1920s, and the worldwide depression in the 1930s, the pearl industry has never really recovered although a small number of Saudi Arabian and Bahraini pearlers are still active. Jubail, Qatif on the mainland, and Darin on the island of Tarut, were the principal pearling areas in the Eastern Province. But the main centre for Gulf pearl fishing was Bahrain Island, and from Bahrain the pearls almost all went to the markets of India and Paris.

E. Problems facing Agriculture

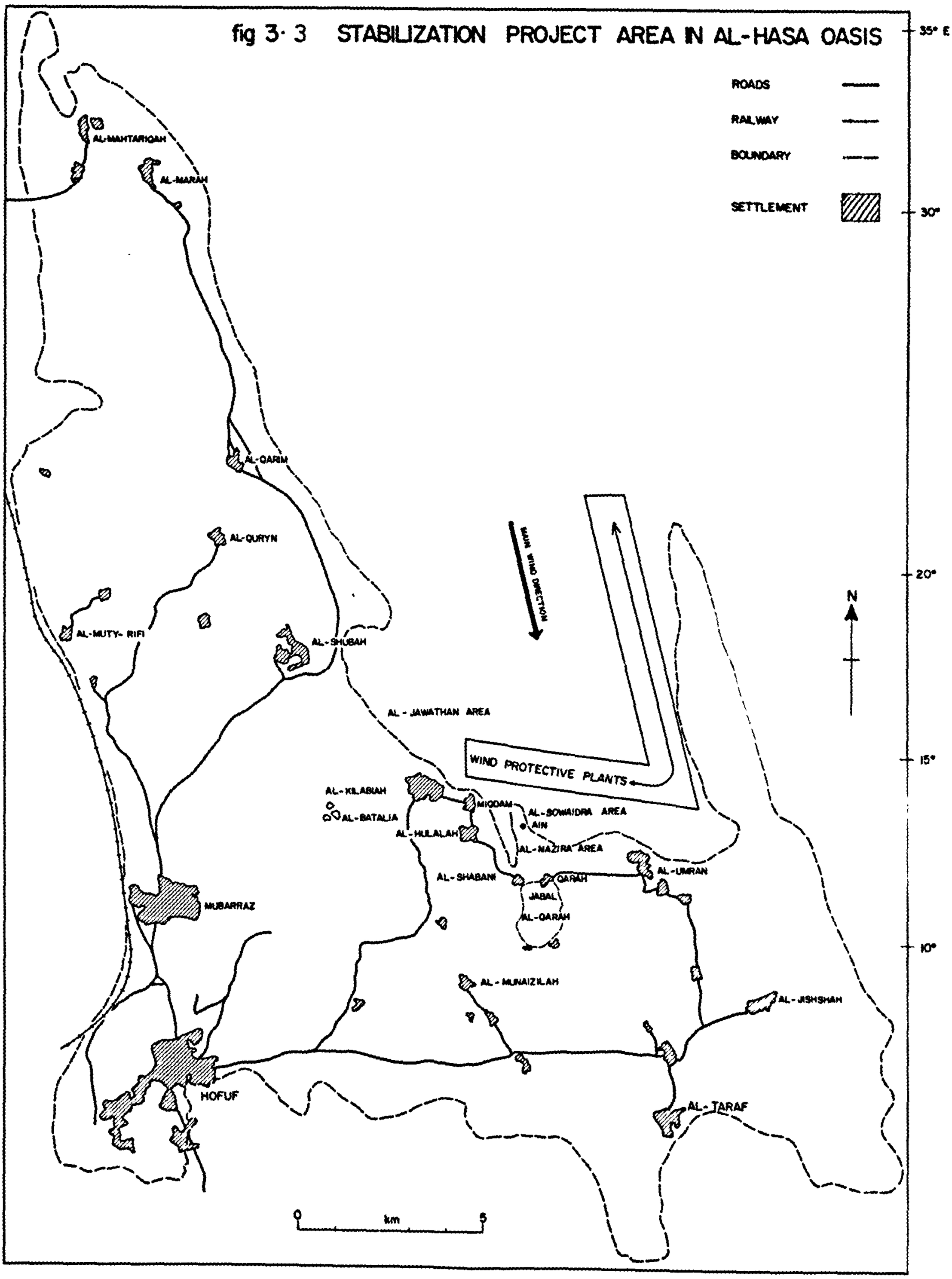
For many years agriculture in the Eastern Province has been facing problems in development. The main problems were in the irrigation systems and the movement of sand dunes, in addition to the shortage cf manpower in agriculture at the present time. The government of Saudi Arabia has planned and carried out new projects for coping with these problems, especially that of irrigation (see pp.40-41) and moving sand dunes.

Due to the physical position of the Eastern Province, which is surrounded by the sands of Dahna west, Summan north west, and Al-Jafura sand south, Al-Hasa Oasis was the main area destroyed by sand from the north. The general shape of Al-Hasa Oasis is like the letter"L", this is almost wholly due to the north and the north west sandy winds which in the past had buried several villages and agricultural areas, and completely abolished them some time ago. The most important area was an active sand dune field, about 8 Km (5 miles) wide by 34 Km (21 miles) long and about 7 m. high, which was encroaching upon the agricultural land and endangering the entire oasis of Al-Hasa. Approximately 100,000 square metres of farming land each year had been destroyed by the moving sand.[14]

The stabilisation project was studied and planned in 1961 by Aramco, and implementation started by the government in 1962. By the end of 1967 three belts of vegetation, each some 50 to 100 metres wide and 8 Km long were completed, and covered an area of about 6060 Donum (150 acres),[15] with an estimated 4,230,000 trees and shrubs.[16] (see Fig.3.3). The plants used in the project were almost all collected locally from the Eastern Province and are mainly Acacia and Tamarisk species with some introduced Eucalyptus.

The third problem, manpower shortage resulting from the discovery of oil, was the major factor which had changed the economic and social conditions, and also the prime factor affecting agriculture and creating the manpower problem. During my fieldwork in the summer of 1973 I met many people in Dhahran, Dammam and Al-Khobar. Most of them were farmers who had left their farms seeking a good income in the new oil towns. (There are no available figures on this, except those of the author's sample survey in population chapter 4 pp.103-128), in addition, the high rate of daily wages for oil workers has severely affected farming processes together with low agricultural income per Donum obtainable from small holdings of the sizes noted on p.38. The labour force engaged in

fig 3· 3 STABILIZATION PROJECT AREA IN AL-HASA OASIS



agriculture is now estimated only to be 5.5% of the total population of the Eastern Province, while the percentage of the members of agricultural families is estimated at 19.7% of the total population of the Province who could help by working in the fields. This very small scale of farming operations, especially difficult to change on tenanted land, makes difficult any great introduction of new technology and the significant raising of farm incomes. Field observation and discussion with farmers suggest that the more enterprising and vigorous younger men leave for the towns so that the residual population is even less open to change. This in turn reduces the contribution which agriculture could make to the growing urban settlements which tend to become heavily reliant on imported agricultural goods; at the same time those towns most closely associated with the rural communities, such as Hofuf and to some extent Qatif, are economically weakened compared with the new non-oasis towns such as Dammam to which the younger more vigorous people move.

The impact of new opportunities on pastoralism has been equally great. The high risks run by the Bedouin nomads in their traditional life style made them extremely open to the attractions presented by some of the new urban-based employment opportunities, e.g. becoming vehicle drivers. At the same time the new road and rail transport media have almost abolished the value of the camel (and therefore the camel-driver) for freight carrying. Theoretically the increased market demand for meat has provided new market openings for pastoralists' goats and sheep but the low prices obtainable for animals driven over long desert trails to market affect this. For the new markets local supply possibilities seem to exist not in the pastoral areas but in new production units such as that at Haradh. Even here, however, there are considerable difficulties.

At Speetzen has shown in his study Ph.D.thesis, October 1974[17] it has proved difficult to get the Bedouin to become sedentary sheep and

goat producers. This is partly because many Bedouin men regard livestock other than camels as women's work but mainly because if they are to give up a nomadic way of life, they prefer to move completely into the urban situations open to them.

There are no recent livestock census figures but all the indirect evidence (such as migration figures - see Chapter 4) suggest that the trends of the 1950's are accelerating. Between 1950 and 1960 in the Eastern Province the numbers of camels are estimated to have dropped from about 100,000 to 1,560, of cattle from 60,000 to 8,296, of sheep and goats from 270,000 to 38,426.(18)

Nomadic pastoralism is virtually extinct in our region.

F. Agriculture and Urban Demands on Land

Inevery case, the new expansion of urban areas takes up land resources, not for cultivation purposes but for building purposes, for living or public use. There is no balance kept in hand of the difference between agricultural and building uses. The landscape of the agricultural areas at both Oases is seen to have been shrinking under pressure of urban expansion. Many built-up areas have been expanded over land formerly covered by date gardens. In addition, date gardens within the towns and cities have been demolished for building purposes (see photographs of various cities). The importance of land for agriculture at present is secondary to building land. The Eastern Province as a region has become more developed economically, the population has increased and the uses of land for building have increased faster than for agriculture at every stage in the process; but the problem is that very few realise the extent to which the profitability of using good agricultural land for building, a consequence of urbanisation which has followed changed economic conditions and of high personal incomes is not necessarily beneficial for the stable economic development of the region, or even the country as a whole. At present there is great hope that agriculture will be given greater scope for improving methods and economies from increased output.

Moreover, a country such as Saudi Arabia should have some agrarian income as well as income from the petroleum industry, because it is not safe to depend entirely on one source of income from a non-renewable source. The income from agriculture must increase to cater for the demands of the population, and also to create some forms of industry based on agricultural raw materials.

Conclusion

The improvement of soil and the abundance of water have made intensive cultivation possible in the region, and greatly improved the contribution of this land, compared with the agricultural production of many years ago. The type of production which was used was only for dates, with a few vegetables; prior to 1950 agricultural production in the Eastern Province was extremely limited both in quality and quantity. The discovery of oil, and the increasing business population brought a demand for larger quantities and more variety of crops, together with new modern life.

Prior to 1959 some varieties of vegetable were brought to the region to grow, to cater for the increased demand in agricultural production, but the production of vegetables was not sufficient. As well as technical improvements in soil and irrigation management, farmers' education, the development of market outlets in agricultural processing industry and other aspects have started to be established. This of course strengthens the links between the country and the towns.

After 1960 improvements were made in soil management, land fertility etc, using chemical fertilisers, new irrigation and drainage systems, cultural practices, methods of planting and packing of produce and marketing techniques. These improvements were reflected in a wide range of new vegetables which were introduced on a commercial scale, and greater increases in yield per donum of land than ever before. About 30 different kinds of vegetables are now

being grown commercially, and their season lengthened from two to six months. During 1970 Aramco Agricultural Assistance Division assisted 90 farmers in producing about 3,892,517Kg (8,583,000lbs) of 27 types of vegetables,[24] which brought the farmers about SR4042 million.[25] This total of crops was higher than that of 1965; for example, the crop of egg plant was formerly available for only six months of the year, and is now available almost all the year round. In another production of the agricultural circuit, eg local egg production, rose from 564,000 in 1959 to 1,940,000 during 1967, and to 22,220,000 during 1970.[26] These quantities of agricultural production, brought about as a result of improvement in different varieties of crops, make us hope that agricultural production in the province will rise mainly in vegetables and fruit crops, and will soon cover the demands of all the local markets. The other crops, such as dates and field crops are still second in importance; dates are a very economic crop to produce, and it may be possible to industrialise the processing of palm products.

Agriculture and agricultural settlement was and mostly still is limited in area and determined in distribution by the nature of available resources. The natural human response was in the form of oases - concentration, morphology and distribution determined by physical factors. This was the dominant fact in settlement geography until recently on micro-scales and the macro-scale. The oasis settlements, unlike the newly-created towns, have had to change internally and also in their external relationships and relative status as the result of oil exploitation, industrialisation and the establishment of new settlements. As we shall later see, however, both in Qatif and Al-Hasa the survival of agriculture and the new importance of agriculture to Saudi Arabia has meant that urban growth has to take place in a rural context in these areas which, up to 20 years ago, were the only significant areas of settlement in the Eastern Province.

The improvement in agricultural conditions in the province during the past 13 years, though experimentation with new varieties of crops, should give the farmer encouragement towards commercialisation and also by the increased demand, to push forward to accelerate agricultural development. That could be one of the most serious factors relating to the social and economic structure of the country - to increase the capacity of agricultural production. The consideration of most of the business companies is in the commercial sector; no-one in the agricultural sector has yet approached agriculture wholeheartedly as a field for investment in specialised commercial products for the home and export market. This is one of the requirements in the region in order to create a future source of income.

Agriculture is especially important since national reliance on one resource, such as the oil, which while giving a temporary opulence, may only last for one or two generations or even three, but not for ever. If the country stands where it is without creating another resource, sooner or later it will lose out when the resource is ended.
There are many examples in Western Europe and the U.S.A. of depression following the economic exhaustion of mineral resources, parts of N.E. England, southern Belgium, the Yukon, etc.

The building of houses, schools, hospitals and roads and other facilities is an excellent provision of social and physical infrastructure but little of this, mainly urban investment, is not directly productive and does not in itself increase the real national income. The scale of expenditure, current as well as capital, in education, health, transport etc. first of all depends on the size of the national income of the country, and the stability and relative permanence of the source of that income. Reliance on oil means that the country is literally using its capital resources not only for capital investment but also for current consumption and the future current expenditure to which the future is committed by the nature of capital expenditure.

For a country such as Saudi Arabia which has, as yet, only a limited basis for industries other than oil or gas based, agriculture is a vital production sector capable of considerable expansion. In spite of this, agriculture would appear to be losing ground. The groundwater resources of the Eastern Province are now needed for urban and industrial consumption as well as for irrigation and in the second Five-year Plan 1385-1390 it has been decided that increased water extraction for agriculture should only be permitted where there is clear evidence that this is in the long term national interest. While this last point could be fairly easy to demonstrate, the fact is that the urban and industrial demand for water in the Eastern Province, together with the vast extra amounts wanted for oil-field injection, cannot be supplied in time quickly enough by desalination projects. Inevitably therefore there is bound to be a growing demand for groundwater for non-agricultural purposes.

Already it has been noted that at the present scale of farm operation, the returns are so small compared with those which can be obtained in industrial and commercial employment - mainly in the new non-rural towns that there is little incentive for farmers to continue their activities. Since, also the manpower shortage in Saudi Arabia as a whole and the Eastern province in particular is becoming more acute, the migration tends noted in Chapter 4 , are likely to strengthen. Urban and industrial outlets for investment, particularly in land and buildings are so profitable that there is also no incentive for private investment in agriculture.

Within the next ten years the transformation of the settlements of the Eastern Province, from being based on oasis agriculture, and some fishing, both based on renewable resources, to a system completely dominated by manufacturing industry and commerce, based on non-renewable oil and oil wealth, might be completed. What we see in this study is only one stage in an accelerating process of change. The oil industry has given the province new and greater economic possibilities and the possibility of

a better way of life for its people. This has affected not only the Bedouin but also the fishermen and pearlers and sedentary oasis cultivators. In particular people have left the small traditional industries and gone to work in the higher paid oil industry and in the new service and manufacturing sectors, taking up residence in the new oil towns of the region. One important result is that the scale of activity and the nature of economic relationships are changing not only in the new urban areas but everywhere. For example, Saudi Arabia can no longer depend on individuals for the expansion of its farming and marine industries. These resources must be investigated and developed by the government and/or large institutions on a large scale into company projects such as the Haradh settlement livestock project, and the Qusaibi shrimp factory for utilising marine resources. New technologies, the profitable use of capital, the necessity of having high investment in physical infra-structures, these and other factors are affecting not only the cities but the whole region through spatial networks of various kinds.

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CHAPTER FOUR

THE POPULATION OF THE EASTERN PROVINCE AND ITS SETTLEMENTS

In this chapter an analysis is made of the population data available for the Eastern Province and its settlements, in order to help our understanding of the evolution of settlements. Such an analysis is made difficult by the paucity of data and the chapter opens with a note on census and survey information. The second section is concerned with the origins and national composition of the Eastern Province's population and sub-regional characteristics, mainly as defined in the unpublished 1962-63 census. The chapter, using this data, then proceeds to consider various other population aspects of the province and its settlements including concentration ratios, urban centres and urbanised areas, rank-size and population structures, ending with an attempt to project population growth from the 1962-63 base. The author's own sample enumerations are examined separately with special reference to the demographic consequences of immigration.

Population Data

There are no generally accepted census based population statistics for Saudi Arabia or for any of its regions. The only statistics are estimates based on different criteria, made by different authorities for different purposes; the UNESCO and the UN and FAO Organisations have made conjectural estimates of the total population of Saudi Arabia for several years as follows. (See Table 4.1)

The Saudi Government carried out the first census of population in Saudi Arabia in 1962-63, which gave a figure for the total population of 3,306,600 inhabitants. But the Government did not approve the result officially, and it has not published all the data obtained in the census

either for this study area or for other areas. The result of the 1974/75 census have similarly not been published.

TABLE 4.1

POPULATION ESTIMATES FOR SAUDI ARABIA

UNESCO Estimates		UN Estimates		FAO Estimates	
				1937	5,486,000
		1946	6,000,000		
1950	4,890,000			1950	6,000,000
		1952	7,000,000		
				1953	7,000,000
1960	5,980,000			1960	6,036,000
		1962	6,400,000		
				1964	6,630,000
1965	6,750,000	1965	6,750,000		
1970	7,740,000	1970	7,740,000		
1971	7,965,000				
		1972	8,199,000		

The Eastern Province's population was estimated by Aramco in 1960 as the result of air survey and sample studies, at a figure of 349,000 inhabitants. Another estimate of 391,000 inhabitants was published in the minutes of the Arab Development Department of Aramco and partners and consultants of the Associated Consulting Engineers ACE meeting in Beirut in February 1958.[4] The Department of Statistics in the Ministry of Finance and National Economy had estimated the province population to be about 361,000 inhabitants in 1962.[5]

Carrying out a census in Saudi Arabia meets with several problems which must be mentioned here:

1. The physical or geographical characteristics of Saudi Arabia and the distribution of population. Nearly half the population lives in settlement units between 7 and 1,000 persons in size, distributed over a land with an area of 1,248,000 square kilometres, mostly desert.

2. The nomads are difficult to enumerate in any particular area because

they usually roam, each tribe within its territory, looking for places of recent rainfall, good grazing and water resources.

3. There are no accurate administrative boundaries within the country to delimit areas of enumeration.

4. There are, at present no complete vital statistics of births and deaths which could be used to estimate the natural increase rate of the population, because many people do not register for such a purpose.

More recently the government planned an improved census of the population in which the Department of Statistics of Saudi Ministry of Finance and National Economy collaborated with the Department of Photogrammetry of Saudi Ministry of Petroleum and Mineral Resources. The census was planned to be finished in 1975, but as yet (Jan. 1976) no data has been published.

The population data, which is analysed in this study is therefore partly from the population census of 1962-63 and partly from other unpublished figures. The latter are from an unpublished survey which covered settlements and sub-regions of the Eastern Province. The census gave figures of the total population of the Province of 360,852 inhabitants, which was estimated to be about 10.9% of the population of Saudi Arabia.

The Origin of the Population

On the western coast of the Arabian Gulf settlement has existed a long time, most probably as early as 2500 BC.[6] From that date to the present time, according to traditional sources, the Gulf area has passed through seven major stages of internal movement and immigration. The first two stages were pre-Islamic; the five subsequent stages date from the beginning of Islam.

In recent years the racial characteristics of the population in the Gulf area has changed markedly; Persian, Indian and other races have mixed together with the indigenous population. For example, the people of Qatif have stronger Persian characteristics than those of

Al-Hasa, partly because Qatif has shared the sect of 'Shi'iah' with Persia and Iraq for many centuries.

Although the population of the Eastern Province is partly derived from the recent tribes which occupied the Arabian Gulf areas, there are also people from Najid, Hijaz, Asir and other areas in Saudi Arabia, and even from neighbouring Arab countries and elsewhere, who immigrated into the province and settled down in different areas for different purposes. Recently the areas with an especially high proportion of immigrants have been the new towns and cities. (See Table 4.2 which shows the distribution of Saudis and non-Saudis in the Eastern Province).

TABLE 4.2
DISTRIBUTION OF SAUDI AND NON-SAUDI POPULATION BY REGIONS

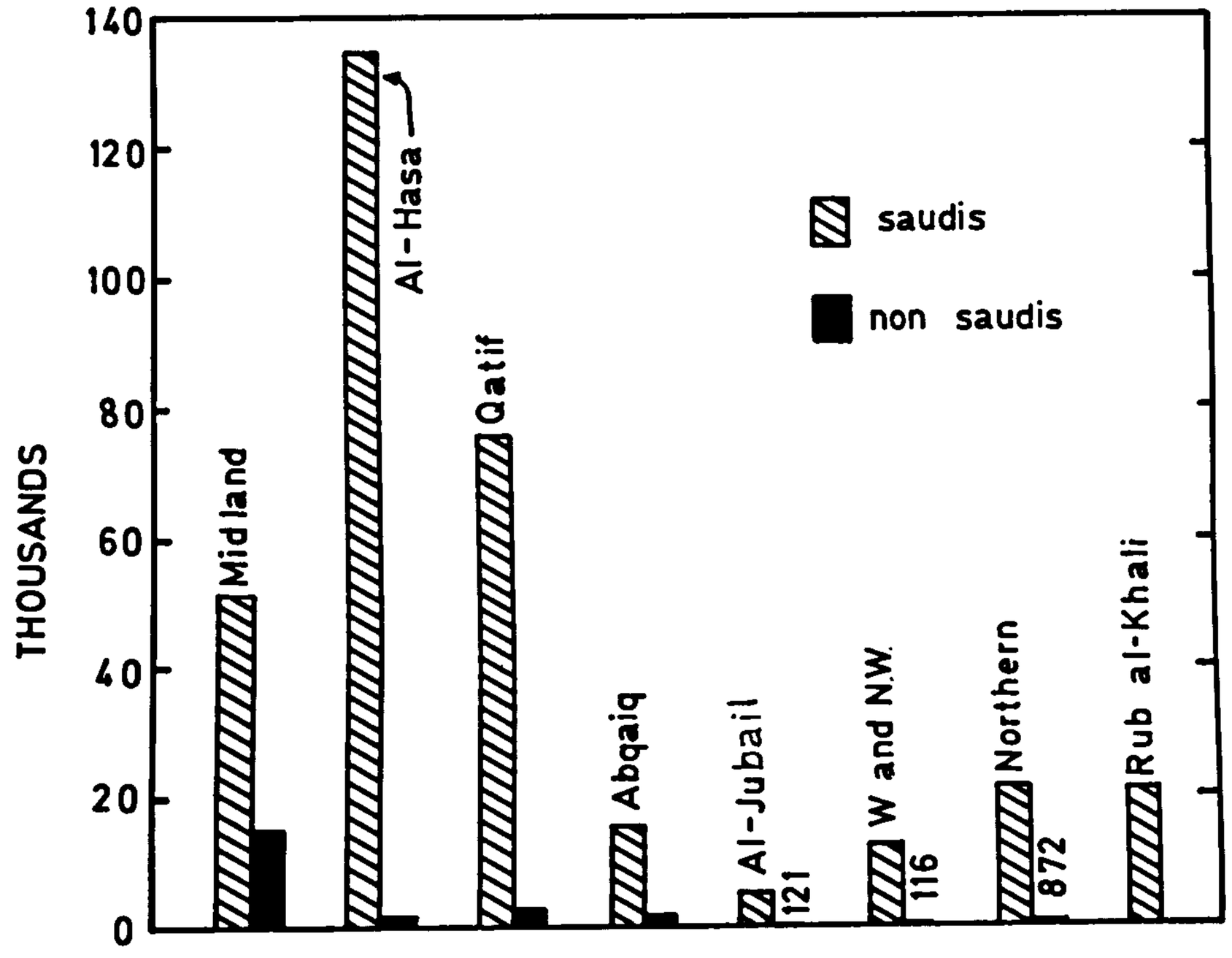
Region	Population	Saudis	%	Non-Saudis	%
Midland	66,245	51,270	77.4	14,975	22.6
Al-Hasa	136,160	134,847	99.0	1,313	1.0
Qatif	78,068	75,479	96.7	2,598	3.3
Abqaiq	17,073	15,500	90.8	1,573	9.2
Al-Jubail	5,808	5,687	97.9	121	2.1
West/North-West	12,814	12,698	99.1	116	0.9
Northern	22,821	21,949	96.2	872	3.8
Rub Al-Khali	21,863	21,863	100	-	-
TOTALS	360,852	339,293	94.0	21,559	6.0

Source: Population Survey in 1962-63

The highest proportion of non-Saudis in the eight provincial regions was in the midland region (22.6%) which includes Dhahran, Al-Khobar and Dammam, the towns with the highest proportion of non-Saudis. Conversely, the lowest proportion was in the Rub Al-Khali, where there are no non-Saudis. The proportion of non-Saudis in the whole of the Eastern Province was very small, (6.0%) of the province's population in 1962-63.

This figure may be compared with the proportion of non-indigenous inhabitants in the neighbouring countries of Kuwait (53.0%) and Bahrain (82.5% in 1971). (See Table 4.3 and Fig. 4.1)

FIG. 4.1.



National composition of the Eastern province's population (saudis and non saudis) by regions (1962-63)

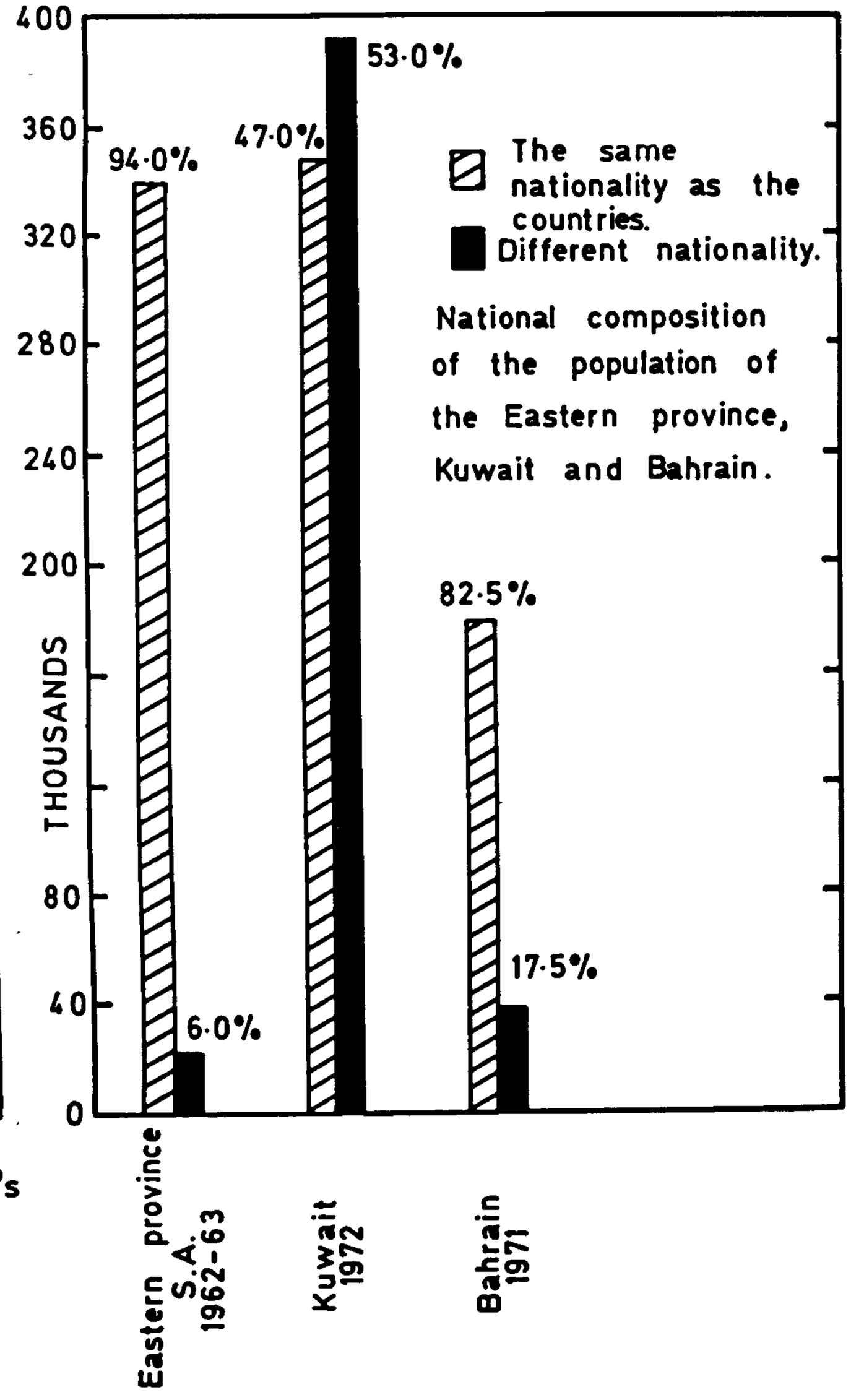


TABLE 4.3

NATIONAL COMPOSITION OF THE POPULATION COMPARED WITH KUWAIT AND BAHRAIN

Eastern Province, Saudi Arabia					Kuwait					Bahrain				
Population	Saudis	%	Others	%	Population	Kuwaitis	%	Others	%	Population	Bahrainis	%	Others	%
360852	339293	94.0	21559	6.0	738662	347396	47.0	391266	53.0	216078	178193	82.5	37885	17.5

Source: Population Survey 1962-63 in the Eastern Province
Statistical Yearbook of Kuwait 1972
Statistical Yearbook of the Population Census of Bahrain 1971

Urban, Rural and Nomad Population

In Saudi Arabia, even in the relatively urbanised Eastern Province, it is difficult to make a satisfactory distinction between urban and rural societies, because in practice the whole society is not sharply divided into two such clearly differentiated parts. In general there has been a continual process of urbanisation through history so that there has been an increasingly general distinction between three types of community in our region of study, i.e. nomadic, rural/agricultural and urban. The 1962-63 data recognised the obvious characteristics of these as:

(a) nomadic scattered desert dwellers living in tents and centred around water wells.

(b) rural, mainly cultivating peoples living in small non-specialised villages and hamlets in cultivable, irrigable oases.

(c) urban inhabitants of relatively specialised non-primary activity in large settlements - towns and cities - exercising socio-economic influences on their hinterlands.

For our first analysis of the 1962-63 data we can make some sub-regional distinctions. The Eastern Province, contains eight areas totalling 279,444 square kilometres, which is about 23.5% of the area of Saudi Arabia. The largest area is the Southern (about 29.4% of the province area) occupying the north-east part of the Rub-al-Khali; the second area in size is in the west and north-west of the province. Three out of the eight areas are almost desert, and more than 50% of the other areas is desert. The most important area is the midland, which is the heart and central point of the province. (See the map of distribution of areas, Fig. 4.2 and Table 4.4).

These areas may be classified according to their main economic function. Each of the areas A to E inclusive is functionally integrated around a central place which is larger in population than any other and

FIG. 4.2. AREAS OF THE EASTERN PROVINCE.

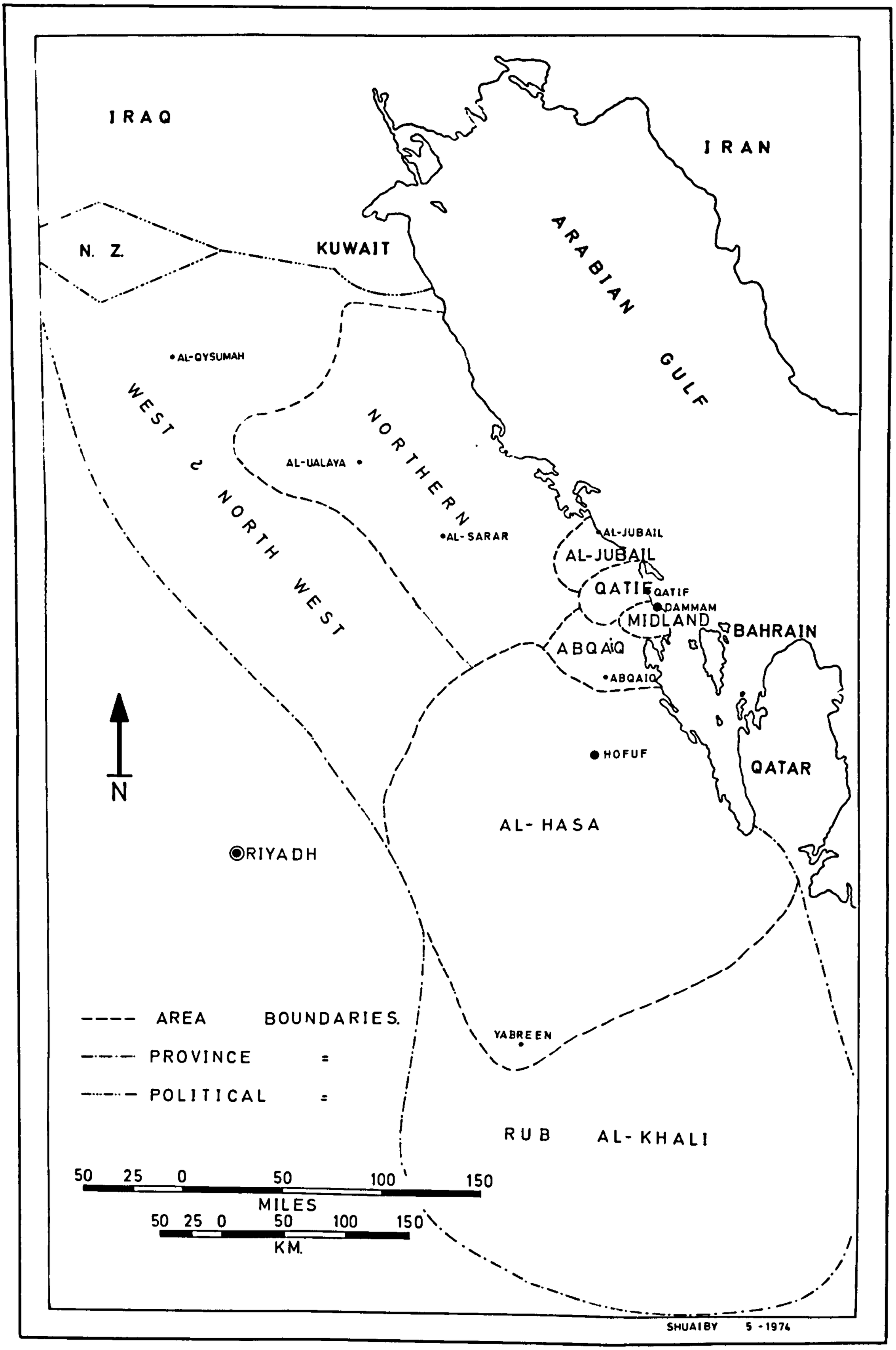


TABLE 4.4
AREAS OF THE EASTERN PROVINCE

Area	Sq. Km.	%	% of Population
Midland	1,007	0.4	18.4
Al-Hasa	72,550	26.0	37.7
Qatif	2,297	0.8	21.6
Abqaiq	4,335	1.6	4.7
Al-Jubail	2,271	0.8	1.7
West/North-West	73,582	26.3	3.5
Northern	41,280	14.7	6.3
Rub-al-Khali	82,122	29.4	6.1
TOTALS	279,444	100	100

Source: Population Survey and Census 1962-63

the most important settlement economically. The following preliminary analysis is based, except where otherwise stated, on the 1962-63 survey, using the type classification then employed. All settlements with populations of 2,500 or more are here classed as urban (See pp. 82-83)

A. Midland Area

This is the central area of the Eastern Province, which includes Al-Khobar, Dammam and Dhahran. All of the population is urban and in total it makes up 18.4% of the province's population (See also pp. 103-107). Al-Khobar: is the shopping centre of the Eastern Province with a small sea-port, a population of 6.5% of the provincial total. Dammam: is the administrative centre of the whole of the Eastern Province, the largest sea-port and the railway headquarters. The population of Dammam is about 9.8% of the province. Dhahran: is the headquarters of the oil company in the Eastern Province (Aramco). It contains the petroleum colleges and the airport of Dhahran, and is linked by railway with Dammam, Anqaiq, Hofuf and Riyadh. The population is very small (2.0% of the province's total population)

B. The Area of Al-Hasa

This oasis area was formerly the most important especially before the discovery of oil. The area contains five urban, sixty rural and fifty-two nomad settlements with a total population of 37.7% of the province's population. (See Table 4.5).

TABLE 4.5
NUMBER OF SETTLEMENTS AND POPULATION PERCENTAGE

Element	No. of Settlements	% of Population	% of Province's Population
Urban	5	63.6	24.0
Rural	60	29.5	11.1
Nomad	73	6.9	2.6
TOTALS	138	100	37.7

Source: Population Survey of the Province 1962-63

Hofuf is one of the five urban settlements, a very ancient city and the most important urban centre. It has a sub-administrative role, and is the agriculture market and the commercial centre of the region of Al-Hasa. A less significant city is Al-Mubarraz, about two kilometres north of Hofuf. Mubarraz is similar functionally to Hofuf.

C. The Area of Qatif

Qatif is an ancient oasis area probably older than Al-Hasa. Qatif contains one of the new oil towns, Rahimah, and an oil refinery. (See Table 4.6)

TABLE 4.6
NUMBER OF SETTLEMENTS AND PERCENTAGE OF POPULATION IN QATIF

Element	No. of Settlements	% of Population	% of Province's Population
Urban	9	73.5	15.9
Rural	24	26.5	5.7
Nomad	-	-	-
TOTALS	33	100	21.6

Source: Population Survey of the Province 1962-63.

The central place of Qatif is Qatif City with a population of 16.3% of the population of the area and 3.5% of the total population of the Eastern Province.

D. The Area of Abqaiq

This is a very recently urbanised area, which developed during the 1950's. There is only one urban centre Abqaiq, an oil town with a population of 51.1% of the area's population and 2.4% of the province's population. Most of the population of Abqaiq town are immigrants who moved from other areas both within and outside the province. The number of settlements in Abqaiq area is one urban, eight rural and thirty-two nomad. (See Table 4.7).

TABLE 4.7
NUMBER OF SETTLEMENTS AND PERCENTAGE OF POPULATION IN ABQAIQ

Element	No. of Settlements	% of Population	% of Province's Population
Urban	1	51.1	2.4
Rural	8	3.6	0.2
Nomad	32	45.3	2.1
TOTALS	41	100	4.7

Source: Population Survey of the Province, 1962-63

The main activity in this area is the oil industry since it contains the largest oil field in the province and in addition the road and railway, which link Abqaiq with Dammam, Hofuf and Riyadh.

E. The Area of Al-Jubail

This was famous as an area of pearl fishing, the importance of which has dwindled because of the discovery of oil and the making of artificial pearls. It contains one urban settlement, Al-Jubail town, for four rural and nineteen nomad settlements. (See Table 4.8)

The main activities of Al-Jubail town are in the local sea port together with a small amount of agricultural production.

TABLE 4.8
NUMBER OF SETTLEMENTS AND PERCENTAGE OF POPULATION IN AL-JUBAIL

Element	No. of Settlements	% of Population	% of Province's Population
Urban	1	78.6	1.3
Rural	4	4.0	0.1
Nomad	22	17.4	0.3
TOTALS	27	100	1.7

Source: Population Survey in the Province, 1962-63.

F. The Remaining Areas of the Eastern Province

These three areas, almost all desert, lie to the west and north-west, north and south of the Eastern Province. These areas are mainly inhabited by rural and nomadic populations which total 16.0% of the province's population. (See Table 4.9)

TABLE 4.9
NUMBER OF SETTLEMENTS & PERCENTAGE OF POPULATION IN THREE AREAS

Element	North/North-west			Northern			Rub Al-Khali		
	Nos.	% of Pop.	% of Total	Nos.	% of Pop.	% of Total	Nos.	% of Pop.	% of Total
Urban	1	21.0	0.7	-	-	-	-	-	-
Rural	6	14.9	0.5	28	51.4	3.3	-	-	-
Nomad	24	64.1	2.3	70	48.6	3.1	-	100	6.1
TOTALS	31	100	3.5	98	100	6.4	-	100	6.1

Source: Population Survey in the Province, 1962-63

These areas are near the boundaries between Saudi Arabia and Kuwait, Saudi Arabia and Iraq neutral zone; the oil pipe-lines which run to Lebanon and the road from the Eastern Province to Jordan (Tapline road) also run through the northern areas.

If we look at the Eastern Province as a whole we can immediately note some salient facts. The population of the Eastern Province in 1962-63 was estimated as 10.9% of the Saudi Arabian population. The urban population was 28.3% of the national urban population, the rural population is 4.2% of the whole rural population; and the nomad population is about 8.5% of the whole nomad population.

Obviously the province appears as relatively heavily urbanised compared with the national average. Equally clearly, in spite of the fact that much of the traditionally important oasis land of Saudi Arabia lies in this region, the total rural population in the province is relatively small even though the number of rural dwellers is more than the number of nomads. (See Table 4.10).

TABLE 4.10
NUMBER AND PERCENTAGE OF THE PROVINCE'S POPULATION COMPARED WITH THE WHOLE IN SAUDI ARABIA

	Saudi Arabian Population	Eastern Province Population	% of Province's Population of Saudi Population
Urban	800,000	226,169	28.3
Rural	1,800,000	75,367	4.2
Nomad	700,000	59,316	8.5
TOTALS	3,300,000	360,852	10.9

Source: (a) J.I. Clarke, W.B. Fisher; Population of M.E. and N.A. 1972, p.227.
(b) Population Survey in the Province, 1962-63.

The percentage of urban population in the province is 62.7%,of rural 20.9% and of nomad 16.4%. The population of the Eastern Province is distributed between 372 settlements of which 20 were officially classified as urban, 130 are rural and 222 are nomad. (See Table 4.11 and also see map of population distribution, Fig. 4.3).

TABLE 4.11
DISTRIBUTION OF SETTLEMENTS AND POPULATION IN THE PROVINCE

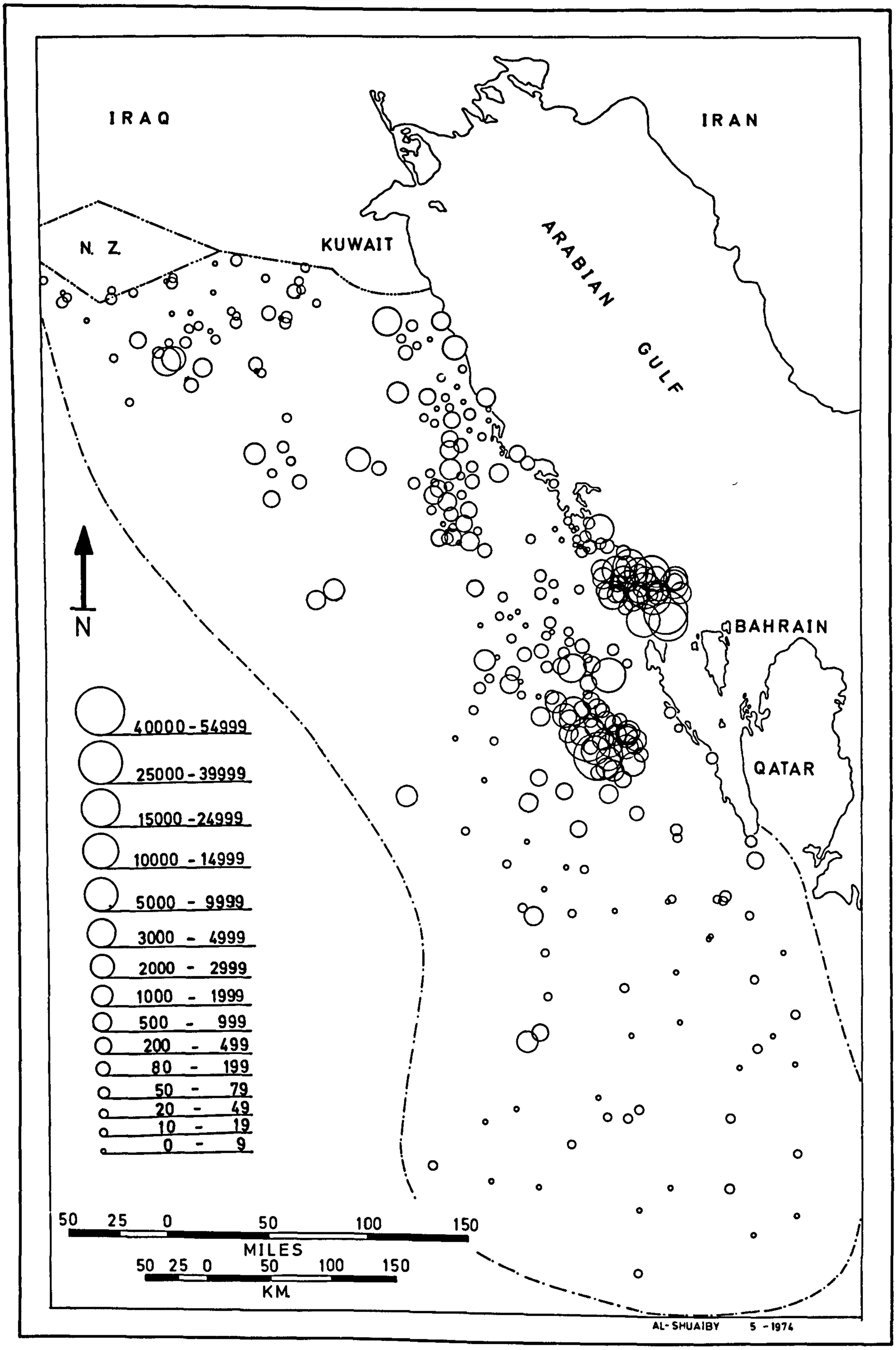
Element	No. of Settlements	Population	Percentage
Urban	20	226,169	62.7
Rural	130	75,367	20.9
Nomad	222	59,316	16.4
TOTALS	372	360,852	100

Source: Population Survey in the Province, 1962-63.

(i) Urban

In the Eastern Province 63.0% of persons live in towns and cities, and six out of eight sub-regions have urban areas; (Midland, Al-Hasa, Qatif,

FIG.4.3. DISTRIBUTION OF THE POPULATION IN THE EASTERN PROVINCE (1962 - 63 SURVEY).



Jubail, Abqaiq, and the west and north-west regions) the differences are very sharp between these regions. The midland region is completely urban with 29.3% of the provincial urban population, and with no rural or nomadic elements. Al-Hasa has an urban population of 66.0%. The Qatif region, has 25.4% of the total urban population of the province but 73.5% of its population was classified as urban. Three other regions have an intermediate level of urbanisation according to the given criteria: Jubail, Abqaiq, the west and north-west of the province.

The remaining two regions of the province are almost entirely rural and nomad.

(ii) Rural

Six out of eight sub-regions have rural areas where 21% of persons live in rural areas, which are divided into farm and non-farm rural areas. The largest number of rural dwellers is in Al-Hasa region, with about 53.3% of the rural total in the Eastern Province. This is because of its large area and its position as the largest oasis. Qatif region which contains a smaller oasis has about 27.5% of the total rural population.

(iii) Nomad

The nomads are distributed between six regions. The main areas of nomad are Rub Al-Khali, and the west and north-west of the Province totalling 16.4% of the province's population (see Table 4.12 showing the distribution of the population in the Eastern Province.)

TABLE 4.12
DISTRIBUTION OF POPULATION IN THE EASTERN PROVINCE

Region	Urban	%	Rural	%	Nomad	%
Midland	66245	29.3	-	-	-	-
Al-Hasa	86584	38.3	40179	53.3	9397	15.8
Qatif	57367	25.4	20701	27.5	-	-
Abqaiq	8719	3.9	612	0.8	7742	13.1
Al-Jubail	4563	2.0	233	0.3	1012	1.7
West/North-west	2690	1.2	1909	2.5	8215	13.8
Northern	-	-	11734	15.6	11087	18.7
Rub Al-Khali	-	-	-	-	21863	36.9
TOTALS	226169	100	75367	100	59316	100

Source: Population Survey in the Eastern Province, 1962-63

The nomads are divided by the survey into three classes according to their areas of settlement as follows:

(i) Nomads within urban areas who live in small groups surrounding the urban areas.

(ii) Nomads within rural areas who live in scattered groups close to the rural areas.

(iii) The majority of nomads who live separately in the desert in tents.

(See Table 4.13 showing the distribution of nomad population)

TABLE 4.13
DISTRIBUTION OF NOMAD POPULATION

Element	No. of Settlements	Population	Percentage
Nomad within urban	2	1,159	1.9
Nomad within rural	57	16,344	27.6
Nomad (separate)	163	41,813	70.5
TOTALS	222	59,316	100

Source: Population Survey in the Eastern Province 1962-63

If, for the purposes of this thesis, we ignore the very small numbers and proportion of nomads who live in areas which on general functional, morphological and size grounds can be called urban, we can make some approximate measurements of concentration ratios which further illustrate the special characteristics of population distribution.

The eastern province is then to be understood as a large territorial unit in which settlements of a great range of size are distributed,in contrast to Kuwait and the other Gulf Emirates which are essentially city states in which there are a very small number of settlements and only one true urban centre.

The Lorenz curve and Gini concentration are often used for this purpose to measure the scale of urbanization in the area. The model is being applied to the eastern province using the distribution of population in the settlements with exception of the nomadic population, the data being for 1962-1963. The model deals with the concentration of population in term

of areas, where the country's geographic units are arranged in order of population density and the cumulative percentage of the number of areas (Y) is plotted against the cumulative percentage of population (X). For comparison a diagonal line is drawn at 45^{o} to show the condition of equal distribution.

The Gini concentration ratio"measures the proportion of the total area under the diagonal that lies in the area between the diagonal and the Lorenz curve".[6] In the eastern province, the ratio obtained is 0.7793. The ratio is similar to that of Venezuela[7] in 1961 (0.7821), and quite different from that of Kuwait (0.4534 in 1970)[8]. (See Lorenz curve, Fig. 4.4 and Gini concentration ratio, Table 4.14). In this table the nomad population has not been included because their residence in the desert is not fixed.

The Density of Urban, Rural and Nomad Population

With a population of 360,852 inhabitants in 1962-63, spread over a land area of almost 279,444 square kilometres, it appears at first sight that the average density in the Eastern Province is very low, 1.3 persons per square kilometre (including desert areas). This low figure, however, conceals contrasts of extremes, since an area like the Eastern Province has many diverse economic activities. The overall low average is natural for a desert area and it is not surprising if seen beside the density of the whole of Saudi Arabia, about 2 persons per square kilometre (again including desert areas) which is as low as that of Australia.[9] Libya, Mauritania, Mongolia have only one person per square kilometre, and Spanish Sahara a density of less than one person per square kilometre. Even Canada, the Central African Republic, Gabon, Congo (Brazzaville) and West Iran all have densities of only 2 persons per square kilometre.[10]

The density map of the Eastern Province (Fig. 4.5) shows eight

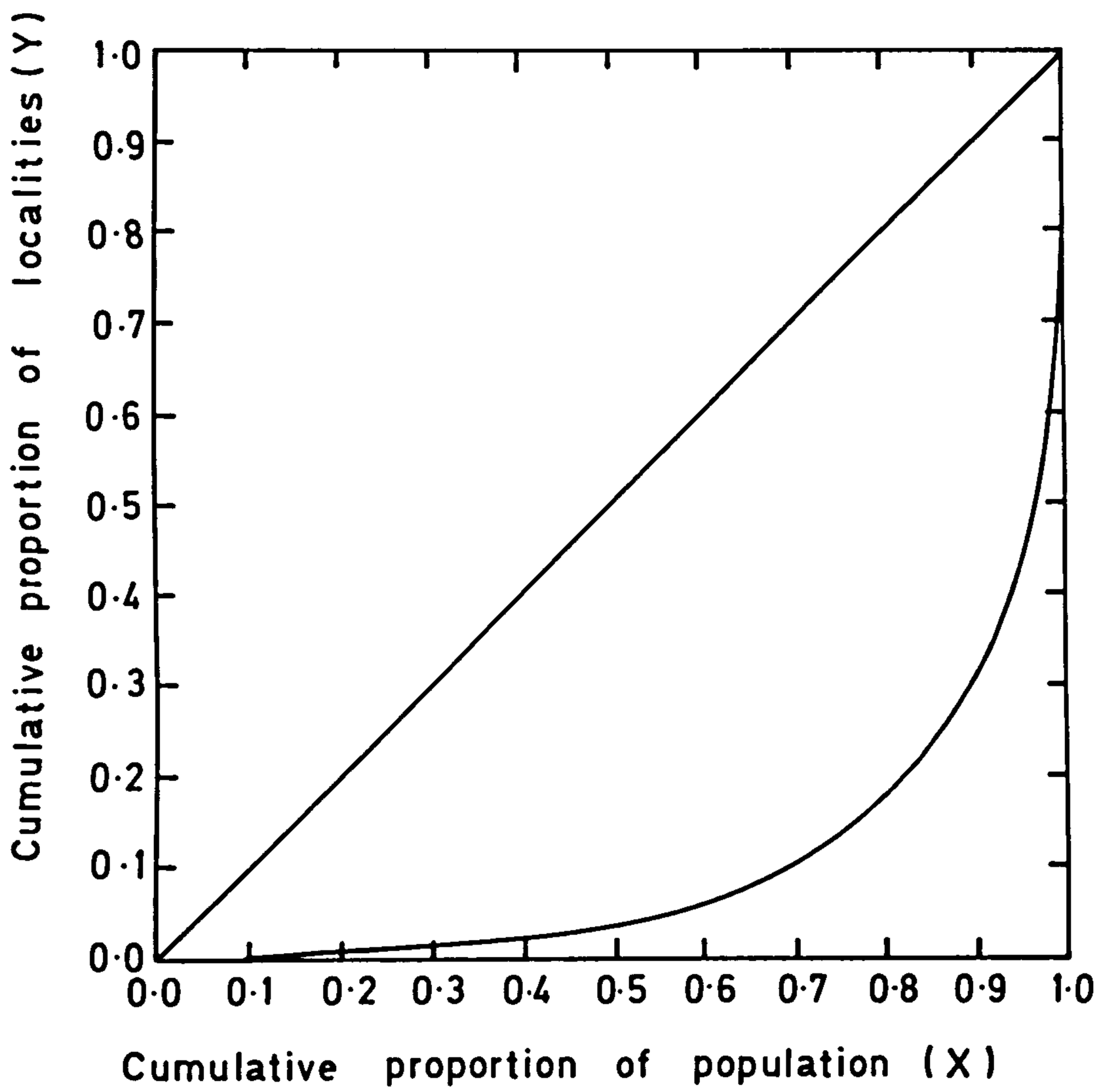


FIG. 4.4.
Lorenz curve for measuring population concentration in the eastern province, in relation to the number of localities. The Nomads not included.

FIG 4.5 POPULATION DENSITY IN THE EASTERN PROVINCE (1962-63)

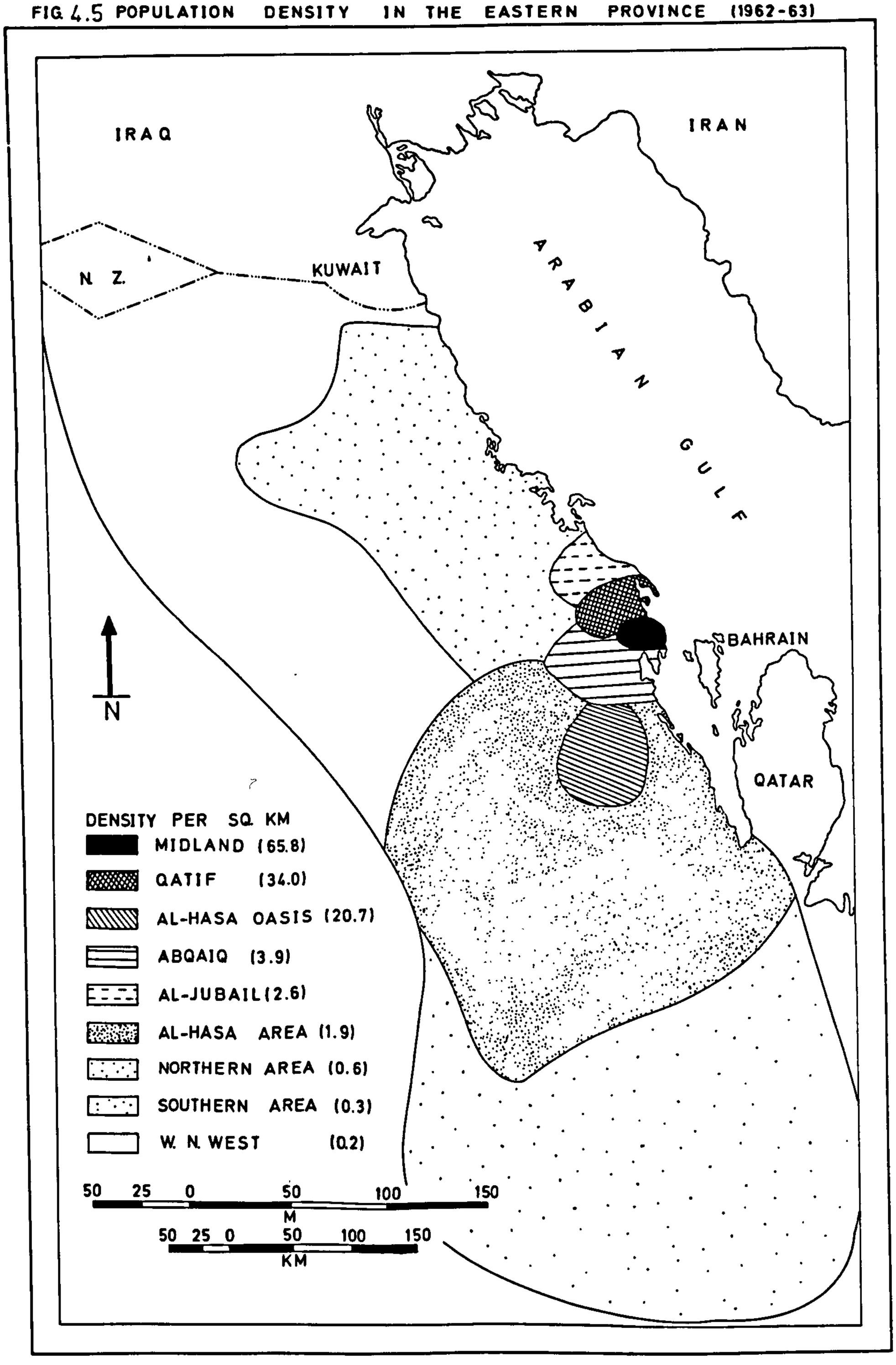


TABLE 4.14

CALCULATION OF GINI CONCENTRATION RATIO FOR PERSONS LIVING IN FIXED SETTLEMENTS

Size of Settlements	Settlements	Population	Proportion		Cumulative Proportion			
			Settlements	Population	Localities Yi	Population Xi	XiYi+1	Xi+Yi
All Settlements	150	301536	1,0000	1,0000	-	-	-	-
10000-99999	6	158737	0.0400	0.5264	0.0400	0.5264	0.0351	0.0252
5000-9999	4	31432	0.0267	0.1042	0.0667	0.6306	0.0841	0.0500
2500-4999	10	36000	0.0667	0.1194	0.1334	0.7500	0.2701	0.1234
1000-2499	34	52726	0.2267	0.1749	0.3601	0.9249	0.5303	0.3538
250-999	32	17397	0.2133	0.0577	0.5734	0.9826	0.7076	0.5708
100-249	22	3852	0.1467	0.0128	0.7201	0.9954	0.9954	0.7201
Less than 100	42	1392	0.2800	0.0048	1.0000	1.0000	-	-
Gini ratio							2.6226	1.8433
Difference of sums							0.7793	

Source: Population Survey in the Province 1962-63

zones of population density. Areas shown in different degrees of shading ranging from the lowest density of 0.2 persons per square kilometre in the west and north-west near Summan and Dahna Sand, to the highest of 65.8 persons per square kilometre in the midland area. The contrasts in the distribution of population between the centre of the province and the fringes are very clear on the map. The desert areas have low population densities, while the population is concentrated on the agricultural land in Al-Hasa and Qatif Oases, along the coast of the Gulf and in the recently developed towns and cities. This is the basic pattern of the population in the Eastern Province, even in Saudi Arabia.

The Density in the Midland Area

The central position and administrative role of this area produce the highest density of 65.8 persons per square kilometre, in an area with only about 0.4% of the Province's total area. In addition the economic growth rate has been faster than in any other area because it contains the largest sea port, the railway of Dammam and the commercial centre of Al-Khobar. The city of Dammam has a high density of 1089.5 persons per square kilometre. Since the employees towns in Dammam and Al-Khobar have been built and expanded, both cities increased in population. (See Table 4.15 showing the densities in the Midland area).

TABLE 4.15
POPULATION DENSITY IN THE MIDLAND AREA

Cities/Towns	Areas (Sq. Km)	Population	Densities (Sq. Km.)
All Areas	1,007	66,245	65.8
Dammam	32.5	35,408	1089.5
Al-Khobar	21.0	23,492	1118.7
Dhahran	23.5	7,345	312.6

Source: Population Survey in the Province 1962-63.

The Density of Al-Hasa Area

The average density in Al-Hasa is about 1.9 persons per square kilometre (where the desert of Al-Hasa has been included in the area), but the density of Al-Hasa Oasis is about 20.7 persons per square

kilometre; (the desert areas now excluded). The individual densities for selected cities and towns are shown in (Table 4.16.)

TABLE 4.16
DENSITY IN AL-HASA AREA FOR SELECTED PLACES

Cities/Towns	Areas (Sq. Km)	Population	Density (Sq.Km)
All area of Al-Hasa	72,550	136,160	1.9
Oasis area	516	106,677	20.7
Hofuf	117.1	51,387	438.8
Mubarraz	41.4	25,395	613.4
Al-Taraf	6.7	3,352	500.3
Al-Jishshah	3.7	2,602	703.2

Source: Population Survey in the Province 1962-63

Al-Jishshah town has the highest density, while Al-Hofuf city has the lowest density in Al-Hasa. The smaller agricultural towns have higher densities because increases in population are not matched by increases in built-up area, but are accommodated within the existing built-up area. The young people of the agricultural families after marriage live together with their parents in one house, and contribute agricultural labour; hence the size of household is larger than in the city. In Hofuf the increase of population has been coupled with a great expansion in built-up area, and this is why the density is lower than in the other urban places in Al-Hasa area.

The Density of Qatif Area

The average density in Qatif area is about 34 persons per square kilometre; and the area is more than one third of that of Al-Hasa Oasis. But the area of Al-Qatif city is also very small, about 3.2% of Al-Hofuf's area, while the population is 24.7% of Al-Hofuf's population, and that means that the density in Qatif city is about 3429.7 persons per square kilometre, higher than anywhere else in the Eastern Province. The high density in Qatif is due to the large size of the family in an agricultural

area; the area is thus similar to Al-Hasa Oasis - Table 4.17 shows the density in Qatif area.

TABLE 4.17
DENSITY IN QATIF AREA FOR SELECTED PLACES

City/Town	Area (Sq. Km)	Population	Density (Sq.Km)
All Area	2297	78,068	34.0
Qatif City	3.7	12,690	3429.7
Syhat	2.7	7,656	2835.6
Safwa	5.0	7,712	1542.4
Al-Kudaih	2.2	4,324	1965.5
Arak	3.0	4,141	1380.3

Source: Population Survey in the Province 1962-63

The Density of Abqaiq Area

The average density is about 3.9 persons per square kilometre. Abqaiq town is the only settlement with a large population in the area, with a density of about 645.8 persons per square kilometre. The remainder in Abqaiq area is desert, where the sparse population lives in scattered groups and density is about 1.9 persons per square kilometre.

The Density of Al-Jubail Area

The average density in Al-Jubail area is about 2.6 persons per square kilometre; the density in Al-Jubail town is 1521 persons per square kilometre. The density of the remaining areas in Al-Jubail, where the population is rural or nomad, is about 0.5 persons per square kilometre.

The Density of the Remainder of the Province

The remaining area includes three desert areas sparsely populated by desert nomads with average population densities ranging from 0.2 to 0.6 per sq. km. (See Table 4.18)

It is clear from population data evidence alone that the regions of the Eastern Province contain different economic activities, agriculture, commerce, industry and businesses etc. Each possesses its own patterns of distribution which reflect the kind of adjustment they have made to local

TABLE 4.18
DENSITIES IN FIVE REGIONS OF THE PROVINCE

Region	Area (Sq.Km)	Population	Density (Sq.Km)
Abqaiq area	4,335	17,073	3.9
Al-Jubail area	2,271	5,808	2.6
West/North-west	73,582	12,814	0.2
Northern area	41,280	22,821	0.6
Southern area	82,122	21,863	0.3

Source: Population Survey in the Eastern province 1962-63.

opportunities and to each other. The spatial pattern of population takes three forms according to differences in density and kind of settlement, which should affect the composition of the population in each region:

(i) some territories of the province are almost uninhabited or only very sparsely settled by nomads or semi-nomads, in the west, north-west and south of the province.

(ii) some other territories are characterised by small nucleated settlements such as farm settlements, over much of Al-Hasa area and in the north of the province.

(iii) the most important territories for this study are the urban centres when the population is concentrated, in Dammam, Al-Khobar, Hofuf and Qatif.

It now becomes necessary to examine more closely the size characteristics of the urban phenomena with which we are concerned. In the 1962-63 census classification the urban population included all persons living in urbanised areas and in places of 2,500 inhabitants or more outside the urbanised areas.

Lynn Smith and Paul E. Zopf Jr.[11] classify 'urban' and 'rural' as follows: from less than 100 to 2,499 inhabitants for rural; from 2,500 to 999,999 and over for urban. Nomads who are found only in the desert area are not distinguished on the size of their settlements

because they do not have permanent areas. A full classification on the basis of community size would then be as follows:

Size of Community

- Rural
  - open country ..... less than 100 inhabitants
  - hamlets ..... 100-249 inhabitants
  - small villages..... 250-999 inhabitants
  - large villages ..... 1000-2499 inhabitants
- Urban
  - small towns ..... 2500-4999 inhabitants
  - large towns ..... 5000-9999 inhabitants
  - small cities..... 10,000-99,999 inhabitants
  - large cities..... 100,000-999,999 inhabitants
  - metropolitan centres... one million or more

Table 4.19 illustrates how this classification could be used for the Eastern Province. However, this simple classification is not very appropriate for the Province, because all urban settlements in the province are less than 52,000 in population, and the smallest settlement having city functions is only 12,690 in population size. Partly to overcome this problem and partly to reflect more completely the spatial concentrations of population and function, it becomes necessary to introduce another type of concept, that of urbanised area, conurbation or city region. None of these terms is wholly appropriate in its western connotation, and yet each one is relevant to the Eastern Province situation. To avoid confusion the term used here to describe a sub-region of urbanised settlements is 'urbanised area'.

Urbanised Areas

If we equate these to what are called 'conurbations' in Britain, they should contain at least one city. According to C.B. Fawcett's definition the conurbation is "an area occupied by a continuous series of dwellings, factories and other buildings, harbours and docks, urban parks and playing fields etc, which are not separated from one another by rural land, though in many cases in this country such an urban area includes enclaves of rural land, which is still in agricultural

TABLE 4.19

CLASSIFICATION OF URBAN, RURAL AND NOMAD SETTLEMENTS BY SIZE OF POPULATION

Size of Community	Category	No.	Population	%	Element	Average Population
Urban total	-	20	226169	62.7	Urban	11308.5
1000000 +	Metropolitan	-	-	-	"	-
100000-999999	Large city	-	-	-	"	-
10000-99999	Small city	6	158737	44.0	"	26456.2
5000-9999	Large town	4	31432	8.7	"	7858.0
2500-4999	Small town	10	36000	10.0	"	3600.0
Rural total	-	130	75367	20.9	Rural	597.7
1000-2499	Large village	34	52726	14.6	"	1550.8
250-999	Small village	32	17397	4.8	"	543.7
100-249	Hamlet	22	3852	1.1	"	175.1
Less than 100	Open country	42	1392	0.4	"	33.1
Nomad total	-	222	59316	16.4	Nomad	267.2
Nomad in urban	Semi nomad	2	1159	0.3	"	579.5
Nomad in rural	Semi nomad	57	16344	4.5	"	286.7
Separate Nomad	Nomad	163	41813	11.6	"	256.5
TOTALS		372	360852	100		970.0

Source: Population Survey in the Eastern Province 1962-63

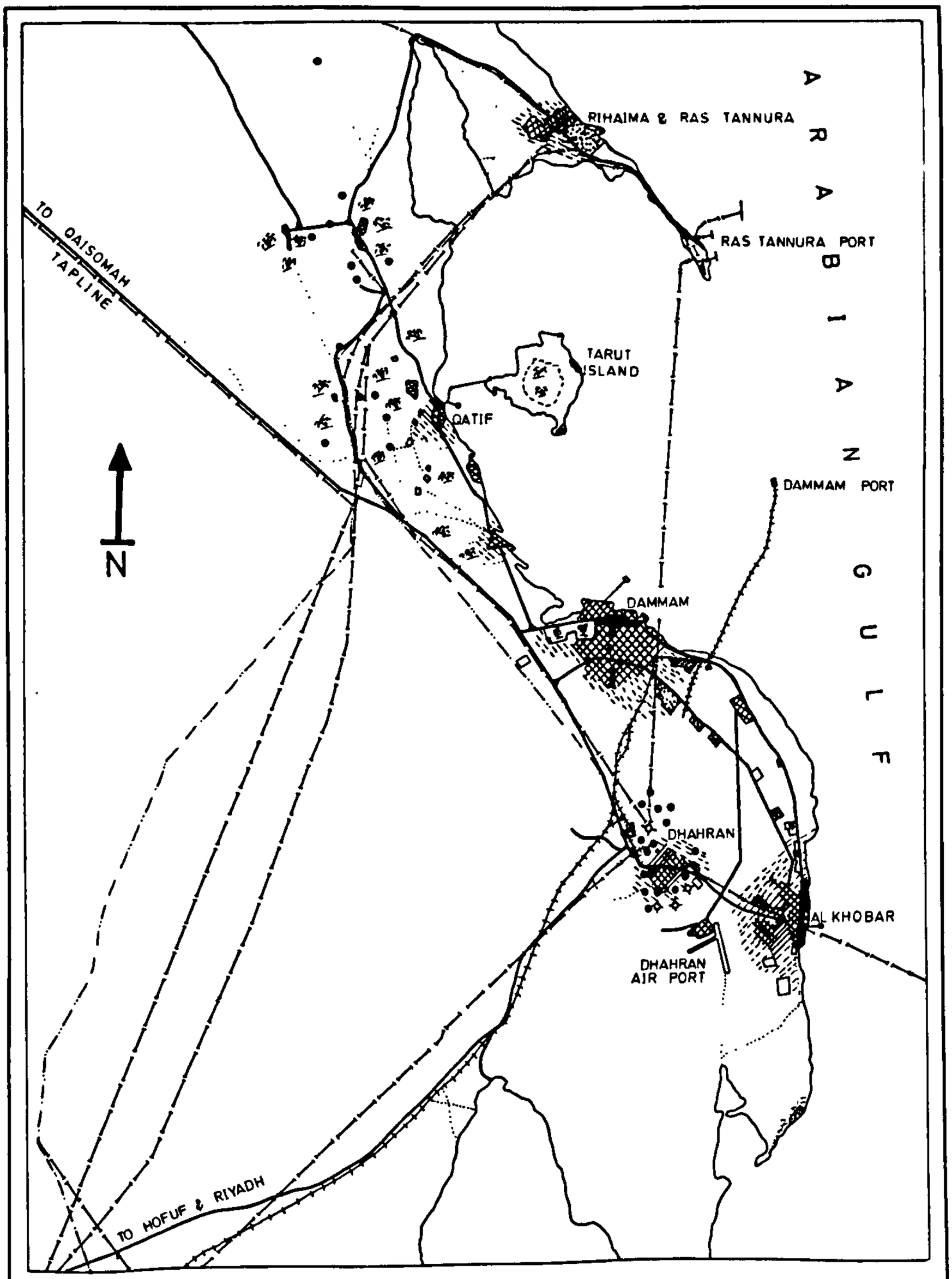
occupation." (By 'this country' Fawcett meant Britain).[12]
T.W. Freeman has suggested that a lower limit for 'minor conurbations' might be set at 250,000; 100,000; 75,000 and he has used a lower limit of 50,000 for the 'minor conurbations'.[13]

These introductory remarks are made in order to establish some criteria at least for a consideration of two "urbanised areas" in the Eastern province which might be regarded as eligible for description as conurbations.

The urbanized area of Dammam (See Fig. 4.6 and also Chapter 8).

This area contains the two new cities of Dammam and Al-Khobar and the one town of Dhahran. It has developed since the 1940's to serve the oil industry in the area. By 1962 it had a combined population of 18.4% of the Eastern Province's population; of this the city of Dammam alone had 53.5% and Al-Khobar had 35.5%. The natural increase rate may be conservatively estimated at 2.5% per year, which gives a population for 1973 in Dammam of 46,467 and in Al-Khobar of 30,817; these figures may be expected to increase to 51,290 and 34,015 by the end of 1977. The three settlements of Dammam, Al-Khobar and Dhahran now have an estimated total population of very nearly 100,000; a figure which is well above Freeman's lower limit for conurbation size. Both cities have grown in association with the oil industry and there are possibilities of even greater expansion in the future. The main factors causing this growth have been the sea port of Dammam and the railway linking Dammam with other cities and towns in the Eastern Province and with Riyadh, the capital of Saudi Arabia. The railway and sea port are paving the way for growth of industry and trade never known before. The railway main office is situated in Dammam city; the sea port is one of the largest on the Arabian Gulf; the government offices and the governor of the Eastern Province are also in Dammam, which is the administrative centre. In addition Dammam is the commercial centre for wholesale and retail trade, and all the

FIG. 4.6. DAMMAM URBANIZED AREA OR CONURBATION.



HOUSING DENSITY:

- HIGH
- MEDIUM
- LOW
- SHOPPING CENTRE
- FACTORIES
- DATE GARDENS
- OIL WELLS
- GAS WELLS
- PAVED ROAD
- UNPAVED ROAD
- RAIL-WAY
- ELECTRIC
- OIL PIPELINE

5 0 5 10 15
KM

5 0 5 10 15
M

facilities serve the province as a whole. Al-Khobar city is the shopping centre of the urbanized area. With its centre only 18 kilometres from that of Dammam, it also has a small port and a new desalination plant. Dhahran, only 4 kilometres from Al-Khobar and 16 kilometres from Dammam, is the headquarters of Aramco. There is an international airport, the petroleum college, and also an oil field nearby. The three places have all spread visibly across their boundaries and are linked by roads and a railway for industrial purposes between Dammam and Dhahran.

The urbanized area of Dammam is mixed in land use. The clearest marked focus is central Dammam and Al-Khobar where are the major shops, retail market, the railway station, hospitals, hotels and business offices etc. From the centre of Dammam there is a road which divides into two roads in the south, one running to the south-west to Dhahran, Abqaiq, Hofuf and Riyadh and the other running to the south-east to Al-Khobar.

The area lying between Dammam, Al Khobar and Dhahran certainly includes land which might be described as "rural" but these enclaves are in fact either sporadically occupied by residential or industrial sites or land no longer used for pastoralism (and never used for cultivation) which for 85% of the area (as estimated from ground survey) has been allocated for centrally planned or individual building development. For example the area lying between the relatively high density continuously built up areas of Dammam and Al Khobar contains an industrial estate, the SAFCO fertiliser plant, a pipe coating factory and the Marine College together with clusters of houses (averaging 40 to 80 in each cluster) as well as scattered individual small buildings.

The area between Dammam and Dhahran has one large factory site - the glass factory and three Petromin depots. In each case there are associated residential clusters. Between Dhahran and Al Khobar lie the air-port and the Petroleum University, each with large residential units, each containing more than 100 residences as well as other minor offices. There are

institutional and public centres such as Petromin offices, the American Council building.

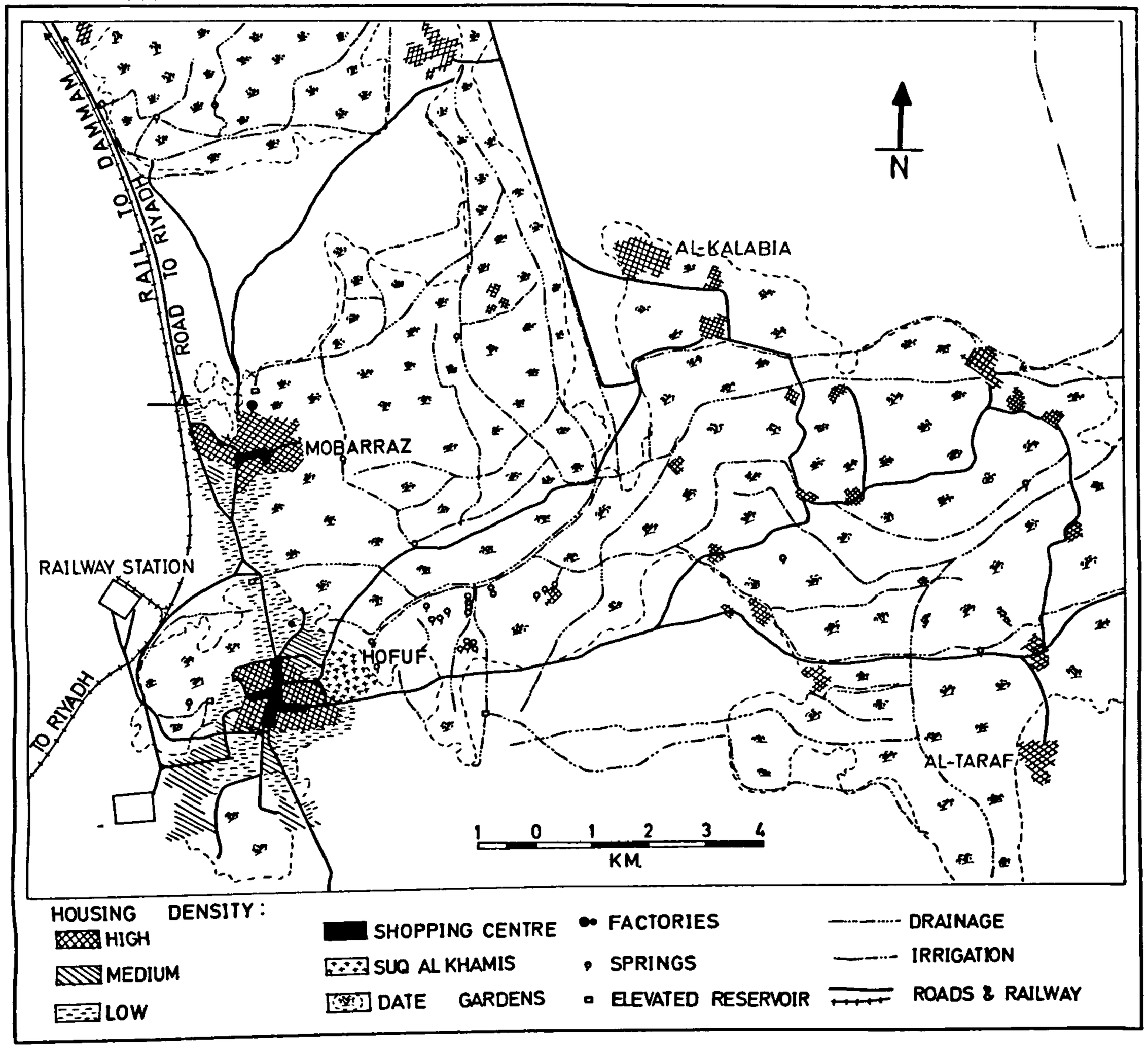
Within the triangle between the three settlements it is impossible to draw any single transect line in which there is a gap of more than 2 kilometres between industrial and business buildings and small to medium sized residential blocks. The three settlements have begun to coalesce with Dammam as the central place. Close to this urbanized area are Qatif City and its surrounding towns (18 kilometres from Dammam) which are linked by road with Dammam. Qatif city contains a small sea port in the oldest quarter of Al-Galaah with its narrow streets.

This urbanised area therefore is non-agricultural and designated by the Planning Office in Dammam for urban, commercial and industrial use. This covers the private sector and government development and is based on a policy of making this the new central region for all modern activities in the Eastern province (excluding special developments at Jubail). In all functions therefore, provincial and municipal administration, commercial, industrial and communications, the urbanised region, in which no agriculture exists and which has an occupied population of almost 100,000 entirely dependent in manufacturing and service industries, could fairly be regarded as a conurbation or at least a conurbation which is in the process of being created.

The Urbanized area of Al-Hasa (See Fig. 4.7)

The Al-Hasa region which is about 170 kilometres south of Dammam is an ancient settled area. Al-Hasa contains two cities, Hofuf, and Mubarraz two kilometres to the north with a population of 25,395, but there are also three towns of Al-Uyoun (3848), Al-Taraf (3352) and Al-Jishshah (2602). By 1962 Hofuf had a combined population of 24% of the province's population. The population of Hofuf city totals about 59.3% of the urbanized area's population; it is estimated that its population increased from 51,387 in 1962-63 to 67,410 inhabitants in 1972-73, and it is expected to increase to 74,406 by 1977. Hofuf is

FIG 4.7 AL-HASA URBANIZED AREA OR CONURBATION.



the local administrative centre of the region of Al-Hasa, being linked by railway with Dammam, Dhahran, Abqaiq and Riyadh, and also linked by paved road with these places. The cities of Hofuf and Mubarraz are closely linked and together serve the needs of the surrounding areas. Hofuf contains the oldest quarter in the oasis, Al-Kut, formerly a significant quarter with its narrow streets and famous fortresses, some of them recently demolished. The industry is on a small scale; there are work shops, a few factories and most important - a cement plant. In the centre of the Hofuf are hospitals, schools, offices of business and government, commercial shops of retail and wholesale, roads and railways. Al-Hasa is of course an urbanised area rather than a classic conurbation in that agricultural land occupies a high proportion of the total area rather than merely enclaves, but for many purposes as we shall see in later sections, it must be regarded as a whole complex rather than a scatter of separated settlements.

If we compare these two urbanised areas, the population in Al-Hasa is more than that of Dammam, the latter totalling about 76.5% of the former. But the dominant occupation for the population of Al-Hasa is agriculture, and commercial and industrial in the Dammam area. The reason is that Al-Hasa is a very ancient region and oasis while Dammam is a very recent growth area rising because of industrial growth and businesses. Table 4.20 shows the population situation for both urbanised areas.

TABLE 4.20
POPULATION AND PERCENTAGES IN THE URBANISED AREAS

Urbanized area	Population	Percentage of the Provincial Total
Dammam	66,245	18.4
Al-Hasa	86,584	24.0
TOTALS	152,829	42.4

Source: Population Survey in the Province 1962-63

TABLE 4.21

RANK AND SIZE OF TOWNS AND CITIES IN THE EASTERN PROVINCE

City or Town	Rank	Actual Population	Expected Population	Actual minus Expected
Al-Hofuf	1	51387	51387	-
Dammam	2	35408	25694	+ 9714
Mobarraz	3	25395	17129	+ 8266
Al-Khobar	4	23492	12847	+10645
Qatif	5	12690	10277	+ 2413
Rahimah	6	10365	8565	+ 1800
Abqaiq	7	8719	7341	+ 1378
Safwa	8	7712	6423	+ 1289
Syhat	9	7656	5710	+ 1956
Dhahran	10	7345	5139	+ 2206
Al-Jubail	11	4563	4672	- 109
Al-Qudaih	12	4324	4282	+ 42
Southern Anak	13	4141	3953	+ 188
Tarut	14	3880	3671	+ 209
Al-Uiyan	15	3848	3426	+ 422
Al-Awamiah	16	3823	3212	+ 611
Al-Taraf	17	3352	3023	+ 329
Sanabiss	18	2776	2855	- 79
Al-Hafar	19	2691	2705	- 15
Al-Jishshah	20	2602	2569	+ 33

Source: Population Survey in the Province 1962-63

Size-Ranking

We can now complete our size evaluation of population and settlements in the region by turning to size-ranking, both for towns and cities, and for the urbanised regions.

The six cities of the Eastern Province are small in population size, ranging between 10,000 and about 50,000. The ranking here includes the cities and towns of the province. The most important cities of Dammam and Al-Khobar rank second (Dammam) and fourth (Al-Khobar). Hofuf ranks first by size of population, and Qatif fifth. (See Table 4.21 showing ranks and size).

The rank of urbanised areas is Al-Hasa area first, Midland second and Qatif area third. (See Table 4.22 showing the ranks and size of the urbanised areas of the eastern province.

TABLE 4.22
RANKS AND SIZE OF THE URBANISED AREAS IN THE PROVINCE

Urbanised Areas	Rank	Actual Population	Expected Population	Actual minus Expected
Al-Hasa	1	86,584	86,584	-
Midland	2	66,245	43,292	+ 22,953
Qatif	3	57,367	28,861	+ 28,506
Abqaiq	4	8,719	21,646	- 12,927
Al-Jubail	5	4,563	17,317	- 12,754
West/North-west	6	2,690	14,431	- 11,741

Source: Population Survey in the Province 1962-63.

Figure 4.8 shows the rank-size relationships for cities and towns, and for urbanised areas, compared with the Zipf theoretical curve (based on R. Thomlinson's "population Dynamics" 1965). The actual rank-size distribution of cities and towns is similar to that predicted by the rank-size curve.

Other Characteristics of the Population of the Eastern Province

Incomplete though demographic data is and although the 1962-63 survey is now over 10 years old, some further information relevant to our settlement survey can nevertheless, with care, be used.

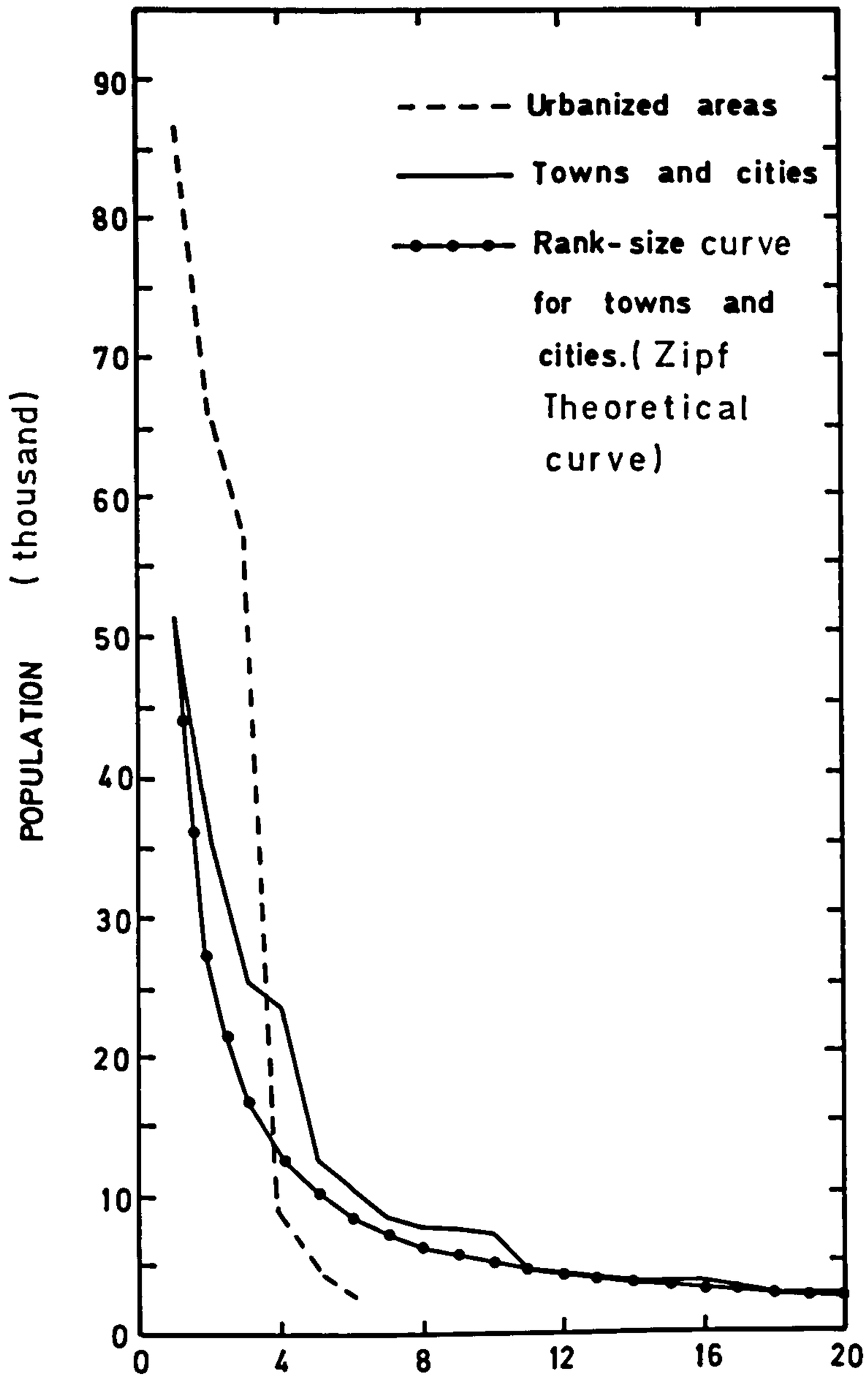


FIG. 4.8 Rank and size of cities and towns, and of urbanized areas, in the eastern province. (1962-63 population survey)

Age Composition and Variations

The age composition of the population seems puzzling at first sight, because the proportion under 10 years old is slightly lower in urban areas than in rural areas; but on further consideration the figures do not appear unusual, because accelerating rural to urban migration of young adults in the late 1950's and early 1960's produced a surplus of people aged 11-50 years old in urban areas compared with rural areas (See Table 4.23, showing the age composition in urban, rural and nomad populations).

TABLE 4.23
AGE COMPOSITION IN URBAN, RURAL AND NOMAD POPULATIONS (%)

Age	Urban	Rural	Nomad
0-10	38.2	38.3	36.9
11-30	31.8	29.2	28.4
31-50	21.8	21.4	22.4
Over 50	8.2	11.1	12.3

Source: Population Survey in the Province 1962-63.

A notable difference is between nomad and other populations: nomads have a higher proportion of people aged 30 and over, and conversely a lower proportion of younger people; this could indicate that there is emigration of young people from nomad areas to rural and urban areas.

Age Compositions of Individual Sub-Regions

The age compositions of the population in sub-regions differ from that of the whole of the Eastern Province. The highest percentages of people aged under 10 years old in urban areas are in the three regions; Midland (35.6), Qatif (30.1) and Al-Hasa (24.5); in rural areas, are in two regions, Al-Hasa (11.4) and Qatif (10.9); in nomad in Rub Al-Khali (38.5). The highest percentages of those aged 11 to 30: in urban areas in three regions, Midland (36.7), Al-Jubail (24.0) and Qatif (22.4); in rural areas in Al-Hasa (8.7), in nomad, in Rub Al-Khali (29.4). The highest percentages of those 50 and over in urban areas in two regions,

TABLE 4.24
AGE COMPOSITION OF POPULATION IN REGIONS OF THE PROVINCE

Region	0-10	11-30	31-50	51+	Total
All Midland		36.7	22.5	5.2	100
Urban	35.6	36.7	22.5	5.2	100
Rural	-	-	-	-	
Nomad	-	-	-	-	
All Al-Hasa	38.6	29.4	22.0	10.0	100
Urban	24.5	18.7	14.0	6.3	63.5
Rural	11.4	8.7	6.5	3.0	29.6
Nomad	2.7	2.0	1.5	0.7	6.9
All Qatif	41.0	30.5	20.2	8.3	100
Urban	30.1	22.4	14.8	6.1	73.4
Rural	10.9	8.1	5.4	2.2	26.6
Nomad	-	-	-	-	
All Abqaiq	36.7	28.6	24.3	10.4	100
Urban	18.8	14.6	12.4	5.3	51.1
Rural	1.3	1.0	0.9	0.4	3.6
Nomad	16.6	13.0	11.0	4.7	45.3
All Al-Jubail	40.0	30.6	21.9	7.5	100
Urban	31.4	24.1	17.2	5.9	78.6
Rural	1.6	1.2	0.9	0.3	4.0
Nomad	7.0	5.3	3.8	1.3	17.4
All West/North-west	35.5	24.7	21.6	18.2	100
Urban	7.4	5.2	4.5	3.8	20.9
Rural	5.3	3.7	3.2	2.7	14.9
Nomad	22.8	15.8	13.9	11.7	64.2
All Northern	33.5	27.1	21.3	18.1	100
Urban	-	-	-	-	
Rural	17.2	13.9	11.0	9.3	51.4
Nomad	16.3	13.2	10.3	8.8	48.6
All Rub Al-Khali	38.6	29.4	22.0	10.0	100
Urban	-	-	-	-	
Rural	-	-	-	-	
Nomad	38.6	29.4	22.0	10.0	100

Source: Population Survey in the Province 1962-63

Al-Hasa (6.4) and Al-Jubail (5.9). (See Table 4.24 showing the age compositions of the regions of the Eastern Province.

Age Compositions in Selected Cities and Towns

It is very interesting to consider the age composition of population in the main towns and cities, which should reflect their central position in the case of the most important places, such as Dammam, Al-Khobar and Dhahran as new residential settlements, and Qatif and Hofuf as the oldest cities in the province. Al-Khobar is the only new city which has a high proportion under 10 years old, because it includes Al-Thuqbah, where 52.4% of the population are under 10 years old, most of whom are Bedouin since the Bedouins have a high fertility. On the other hand, in the central districts of Al-Khobar only 37.1% are under 10, a figure similar to that in Dammam. The other new settlements, Dammam and Dhahran, have lower proportions under 10 years old than the two old towns, Hofuf and Qatif. There is a high percentage aged between 11 and 30 years in Dammam (38.9) and in Dhahran (35.6). The age group 30 to 50 is concentrated in a high proportion at Dhahran, which is almost all populated by the employees of Aramco, whose ages mostly range from 20 to 50. The people aged over 50 years of age are more strongly represented in the old places, Hofuf and Qatif (See Table 4.25).

TABLE 4.25
AGE COMPOSITION IN FIVE PLACES

City/Town	0-10	11-30	31-50	51+
Dammam	35.5	38.9	20.3	5.3
Al-Khobar	42.2	33.8	19.1	4.9
Dhahran	14.7	35.6	42.8	5.9
Qatif	41.0	30.5	20.2	8.3
Hofuf	38.5	29.4	22.0	10.1

Source: Population Survey in the Province 1962-63

Sex Composition and Ratio

Generally males predominate in the sex composition of the province as a whole, because many men have come from outside the province, without wives or children, especially men from abroad, e.g. Yemenis, Hadarim (from the Hadhramaut) and other foreigners who work for Aramco or other companies. The preponderance of males among immigrants has greatly affected the sex composition. The proportion of males is higher in towns than in the country among rural or nomad peoples. (See Table 4.26 showing the sex ratio in urban, rural and nomad populations).

TABLE 4.26
SEX RATIO AND PERCENTAGE EXCESS OF MALES

Element	Sex Ratio	% Excess of Males
Urban	1:201	9.1
Rural	1:092	4.4
Nomad	1:053	2.6
AVERAGE	1:152	7.1

Source: Population Survey of the Province 1962-63

The individual sub-regions vary in sex composition. In the midland and Abqaiq areas males predominate to a greater extent than in any other area. This is because the midland area includes three of the most important towns and cities (Dammam, Al-Khobar and Dhahran) as the business centres of the province, while Abqaiq contains the main oil field. Hence in these two areas males predominate, as wives and children remain in the villages or in their original homes. In only one region do females exceed males in the urban population, in the west and north-west area; and in only one region do females exceed males in the rural population although the situation is there reversed for the urban population. Females exceed males in the nomad population of two areas, Abqaiq and Rub Al-Khali (See Table 4.27 showing sex ratios and percentages of excess of males)

TABLE 4.27
SEX RATIOS AND EXCESS OF MALES

Region	Sex Ratio			% of excess males		
	Urban	Rural	Nomad	Urban	Rural	Nomad
Midland	1:545	-	-	21.5+	-	-
Al-Hasa	1:015	1:024	1:069	0.5+	0.4+	0.2+
Qatif	1:113	1:020	-	3.9+	0.3+	-
Abqaiq	1:869	0:925	0:951	15.5+	0.1+	1.1+
Al-Jubail	1:054	1:543	1:172	2.1+	0.7+	1.4+
West/North-west	0:950	1:075	1:042	6.5-	0.5+	1.3+
Northern	-	1:540	1:322	-	19.6+	6.7+
Rub Al-Khali	-	-	0:956	-	-	1.7-

Source: Population Survey in the Eastern Province 1962-63

The sex ratio is expressed as number of males divided by number of females.

The sex ratios for different age groups in the province show the systematic variation which exists with three types of population, urban, rural and nomad. In the urban population the highest sex ratio is for ages between 31 and 50 years; in the rural and nomad populations the highest sex ratio is for ages over 50 years. (See Table 4.28) showing the differences between sex ratios for urban, rural and nomad population for different age groups.

TABLE 4.28
SEX RATIOS FOR DIFFERENT AGE GROUPS & TYPES OF POPULATION

Element	0-10	11-30	31-50	51 and over
Urban	1.177	1.220	1.232	1.156
Rural	1.083	1.086	1.091	1.138
Nomad	1.048	1.050	1.046	1.080

Source: Population Survey in the Province 1962-63

The sex ratios for the individual regions show no systematic variation between age groups. Midland and Qatif regions have relatively high proportions of working males because of their economic structure. The other regions display relatively slight variation in sex ratio between age groups (See Table 4.29) showing the differences

in the sex ratio between age groups).

TABLE 4.29
DIFFERENCES IN SEX RATIO BETWEEN AGE GROUPS IN REGIONS

Region	0-10	11-30	31-50	51 and over
Midland	1.473	1.547	1.661	1.562
Al-Hasa	1.0209	1.0208	1.0209	1.0208
Qatif	1.0682	1.1044	1.1044	1.10469
Abqaiq	1.3314	1.3313	1.3305	1.3280
Jubail	1.0881	1.0881	1.0870	1.0861
West/North-west	1.0268	1.0269	1.0270	1.0269
Northern	1.4316	1.4316	1.4320	1.4311
Rub Al-Khali	0.9659	0.9660	0.9657	0.9662

Source: Population Survey of the Province 1962-63

Comparing sex ratios in the Eastern Province with those in other countries, the ratio in the Eastern Province is clearly lower than in Kuwait (1.659 compared with 1.152) but the province's sex ratio is similar to that in Bahrain (1.166). However the ratio is higher than that found in most other Arab, European or American countries. (See table 4.30 showing the sex ratio in different countries).

Child/Adult Ratio

The 'child/adult ratio' is the number of children under 10 years old per 100 adults aged 11 years and over. A basic problem in looking at age structure is that the only available date - the 1962-63 survey - gives a very broad breakdown into but four age groups. Hence it has been necessary to take 11 years as the lowest age for adults. An alternative would be to take 30 as the lower limit, but many people get married before that age, especially in rural and nomad communities and so it would not be very appropriate.

The child/adult ratio in rural areas is slightly higher than in urban and nomad areas. (See Table 4.31 showing the child/adult ratio in urban, rural and nomad areas).

TABLE 4.30
SELECTED COUNTRIES' SEX RATIOS

Country	Years	Sex Ratio
Eastern Province	1962-63	1.152
Bahrain	1971	1.166
Kuwait	1961	1.659
Jordan	1961	1.035
Sudan	1963	1.021
Egypt	1960	1.012
Morocco	1960	0.999
UK	1961	0.936
France	1962	0.946
USA	1960	0.971
Canada	1961	1.022
Brazil	1960	0.997
India	1961	1.062
Australia	1961	1.022

Source: (a) Demographic Year Book 1962
(b) Statistical Year Book of Bahrain 1972

TABLE 4.31
CHILD/ADULT RATIO

Urban	Rural	Nomad
61.8	62.1	58.6

Source: Population Survey in the Province 1962-63.

The child/adult ratio for the whole of the Eastern Province is 61.3 which is not as high as in Qatar (83.3). Comparison with other countries, Bahrain, Kuwait, Jordan, Sudan, France and Hong Kong shows that the Eastern Province has quite a high child/adult ratio. (See Table 4.32 showing the child/adult ratio in selected countries.

TABLE 4.32
CHILD/ADULT RATIO IN SELECTED COUNTRIES

E.P.	Bahrain	Qatar	Kuwait	Jordan	Sudan	France	Hong Kong
61.3	43.7	83.3	49.9	47.9	51.8	18.9	43.0

Source: Population Survey in the Province 1962-63

Amongst regions in the highest ratio is Al-Jubail region (66.7) and the lowest in the northern region (50.4). There are no variations in child/adult ratio between urban, rural and nomad areas in the oldest and desert regions, but the regions which include new areas of settlement have some variation in child/adult ratio. (See Table 4.33 showing the child/adult ratio in regions).

TABLE 4.33
CHILD/ADULT RATIO IN REGIONS (URBAN, RURAL AND NOMAD)

Element	Midland	Al-Hasa	Qatif	Abqaiq	Jubail	W/NW	North	Rub Al-Khali
Urban	52.2	62.6	69.5	58.3	66.7	54.8	-	-
Rural	-	62.6	69.5	58.1	66.4	54.8	50.4	-
Nomad	-	62.6	-	58.2	66.5	58.8	50.4	62.6
TOTALS	55.2	62.6	65.7	58.3	66.7	54.8	50.4	62.6

Source: Population Survey in the Province 1962-63

Child/Adult Ratio in Cities

The five main cities of the Eastern Province have different child/adult ratios. The two old cities, Hofuf and Qatif, have higher ratios than the new cities of Dammam, Al-Khobar and the town of Dhahran. The lowest ratio is in Dhahran, which fact is related to the high proportion of immigrants, many of whom have no children with them. 90% of the population in Dhahran are employees working for Aramco; the other 10% of the population work for the government or are the community of the petroleum college. The people working for Aramco, especially the non-Saudis, mostly live in the private quarter of Aramco, without families; the students of the petroleum college also live in Dhahran without families. All these factors affect the child/adult ratio which is very low, when compared with other places in the Eastern Province. (See Table 4.34 showing the child/adult ratio in the five places compared with four places from the Western Province).

The comparison reveals that those cities in the Eastern Province generally have lower ratios than those in the Western Province.

TABLE 4.34
CHILD/ADULT RATIO IN NINE PLACES FROM EASTERN AND WESTERN PROVINCES

Eastern Province		Western Province	
City	Child/Adult Ratio	City	Child/Adult Ratio
Dammam	55.1	Mecca	54.4
Al-Khobar	42.2	Jiddah	51.1
Dhahran	17.2	Medina	55.1
Qatif	69.5	Taife	72.4
Hofuf	62.6		

Source: (a) Population Survey in the Province 1962-63
(b) Population Census in Western Province 1962-63

Life Expectancy in the Province

Unfortunately there are no figures available on life expectancy because, as has already been explained, the vital statistics which are needed to compare life expectancy are grossly incomplete. From about 1964, the government tried hard to make registration of births and deaths more complete, but the effort was not very successful, especially in the case of mortality data.

In my fieldwork I tried to get some data on this subject, but there was none available, nor any accurate records, for two reasons: the relatives of persons who have died rarely go to the registrar's office; a few in urban areas, but virtually nobody in rural and nomad areas. Some of the parents do not register new born children immediately, but registration is made when children start school.

The only general data available was from a sample study by G.O. Industrial Relations Department, Planning Division in November 1955, which gives some idea about life expectancy in the province.

The study gave a figure which fell far below western standards. Life expectancy at birth for Saudi Arabian males was 38 years. This figure was compared with pre-World War II figures from various under-developed countries such as India in 1921 (26.9), Egypt in 1936-38 (35.6), Chile in 1940 (37.9), Mexico in 1940 (37.9), Formosa (now

Taiwan) in 1936-40 (41.1) and also France in 1946-48 (62.5), England in 1948 (66.4).[14]

The largest proportion of deaths occurs in the first five years; from five to 30 the death rate seems to level off but after thirty, as in most countries, the death rate starts rising, yet more sharply than in most other countries. Asfour commented in 1965 that the death rate in Saudi Arabia was not as low as in many other countries.[15] A relatively small proportion of the population lives to a great age, about 60 males per 1,000 reach the age of 70: a very low figure compared with 70 in India, 200 in Egypt; 490 in France and 450 in USA[16] (See graph of the survivors at various ages in Fig.4.9)

Variations in Life Expectancy in the Eastern Province

There were differences between townsmen and nomad men in life expectancy at birth: the nomad men live longer than the townsmen, although townswomen live longer than nomad women.

There are both Sunni and Shi'iah Moslems within the province; Sunnis appear to live longer than the Shi'iahs. (according to ARAMCO Study in 1955.)[17]

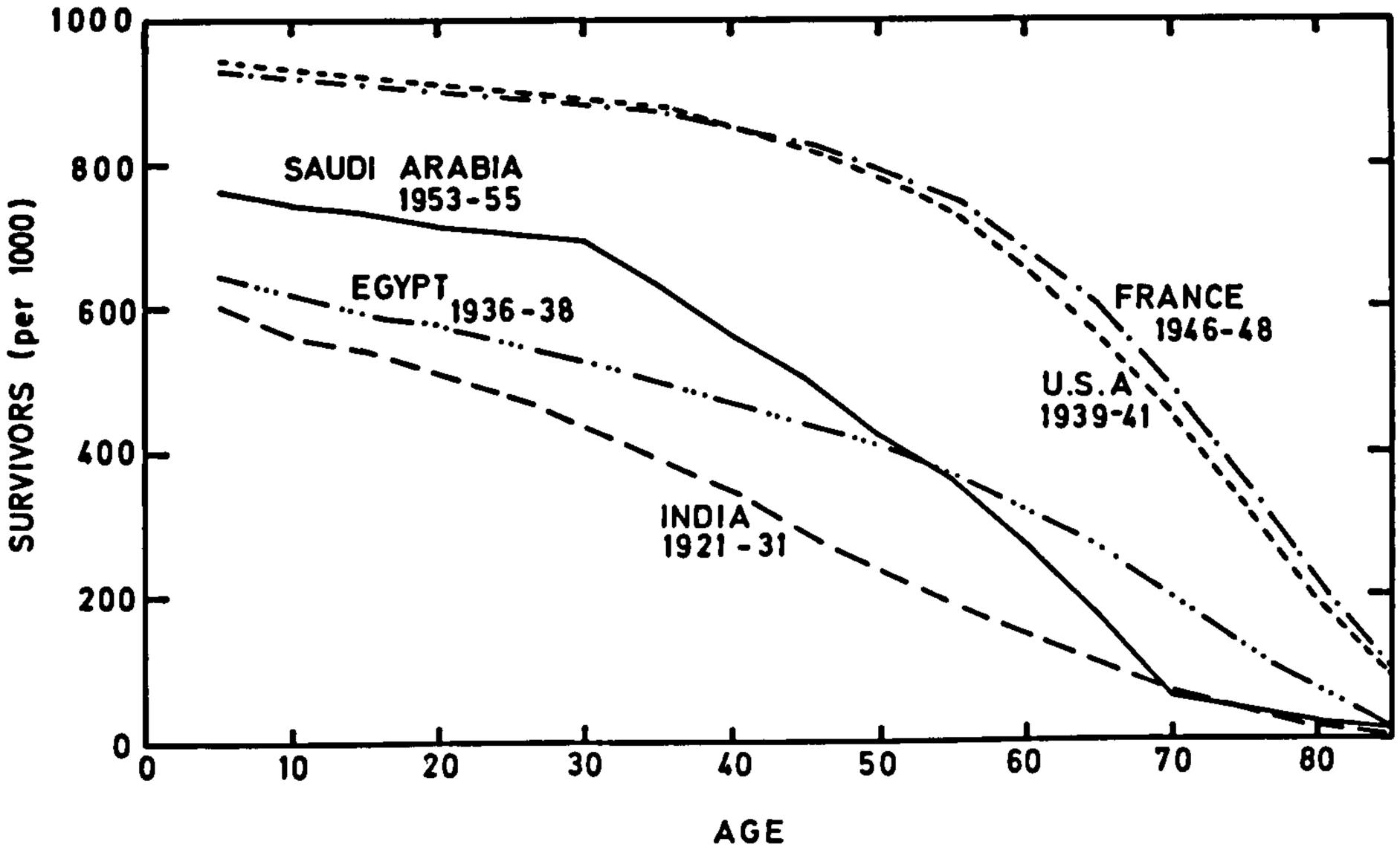
Differences between Al-Hasa and Qatif Oases; there is fairly strong evidence that Hasawis live longer than Qatifis.

Population Growth

In general, the growth rate of population is determined by natural increase and not migration. Natural increase depends on fertility and mortality of the population. Migration is mainly related to economic growth and economic opportunities and also to regulations concerning immigration. Clearly both components are affected by overall health conditions as well as by other social and economic conditions.

In the Eastern Province as well as in the whole of Saudi Arabia there are no vital data which could be used to make a full study of the growth of the population. But some predictions will be made here,

FIG. 4.9 . Survivors at various ages compares Saudi Arabia, with several developed and undeveloped countries.



After: ARAMCO (1955)

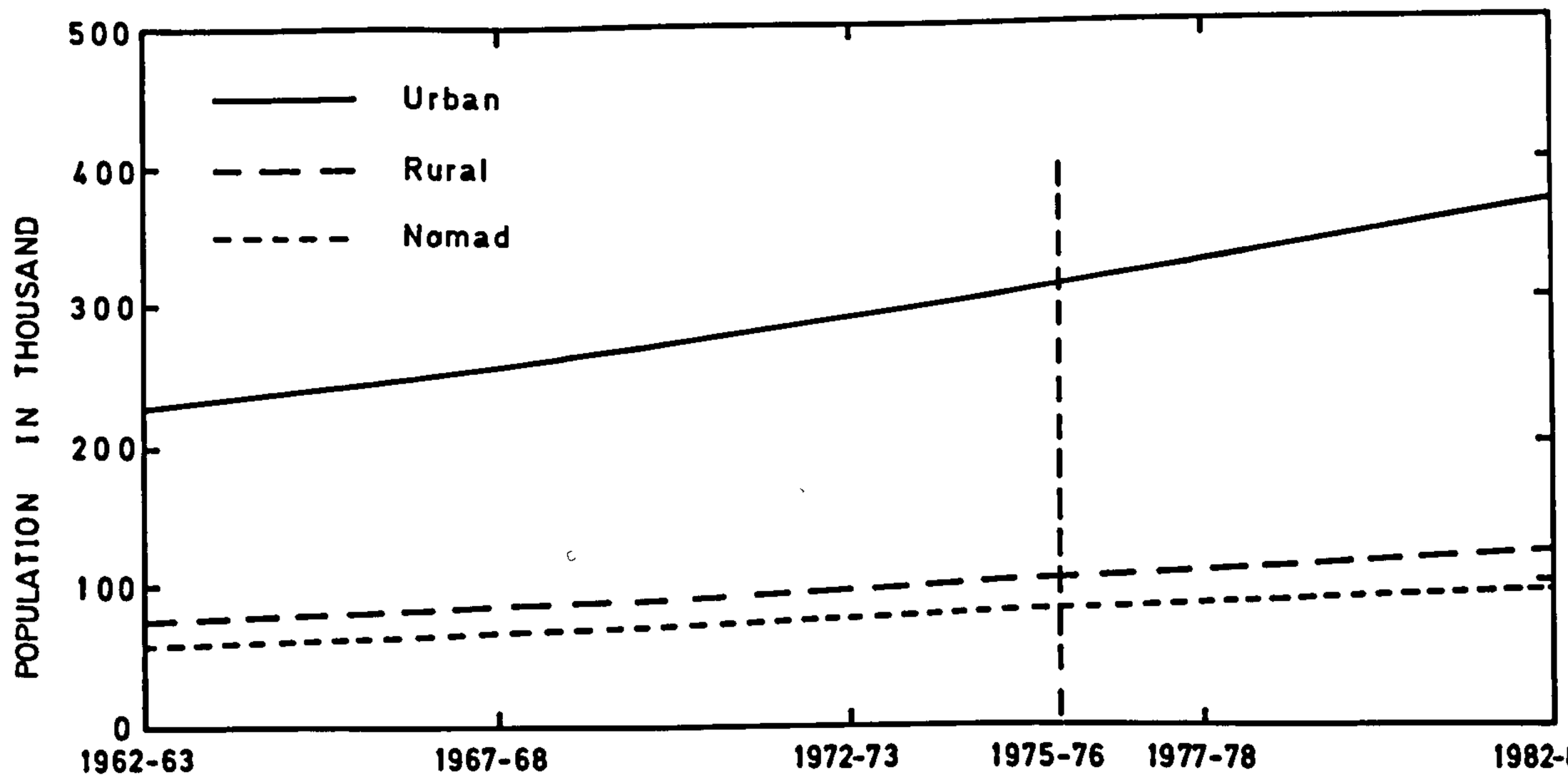


FIG.4 10. The growth of the Eastern province's population from 1962-63 to 1982-83. Projection assuming 2·5% annual increase.

using 2.5% as a conjectural estimate of the actual growth rate, which seems a reasonable figure considering other under-developed countries. Naturally the rate of increase differs between urbanised areas and rural or nomad areas, or in other words, from the cities and towns to the villages. In addition there are many other factors which affect the growth of population:

1. Newly built communities often may have high crude birth rates and low crude death rates, because of the young age structure.
2. The new towns and cities in the Midland region exert a stronger pull upon migrants than any others.
3. The push exerted upon potential migrants in rural and nomad areas induces emigration, which also offsets natural increase in these areas.
4. Old communities such as Qatif and Hofuf, which have older age structures, may be expected to have low crude birthrates, high crude death rates and a low rate of natural increase.[18]
5. Differences in age of the mother at the birth of her first child between urban, rural and nomad populations; ages range from 16 to 18 years in the rural and nomad communities and from 20 to 22 in urban communities.[19]

There is strong evidence for internal movement from nomad and rural areas to towns and cities, because of pull factors, job opportunities and higher wages, which seem to have been the main cause of migration. Dhahran, Abqaiq and Ras-Tannura and many others, even Dammam and Al-Khobar, did not exist before oil exploitation, and the oil industry in the province has created them and been built-up by immigrants from many areas, mainly from Al-Hasa and Najid, (See p.118) The Midland area is likely to benefit increasingly from industrialisation, both in petro-chemicals and generally by the industrial estate which has been established recently and which is characterised by a

heavy emphasis on commerce and service industries which have the fastest relative growth rates.[20]

The figures used here are: 360,852 inhabitants, the enumerated total population in the Eastern Province in 1962-63, and a 2.5% assumed annual increase rate. The population would have risen to about 461,919 in 1972-73 and in the future will rise to approximately 591,295 inhabitants in 1982-83, if the increase rate remains unchanged.

It is unlikely that the overall rate of 2.5% annual increase will apply to urban, rural and nomad components of the population. Rural-urban migration implies that the urban population is growing faster than the rural population. The rural population also receives some nomad immigrants, but the nomads only lose by migration, which offsets much of the natural increase, or by the loss of those who settle down, and hence cease to become nomads. (An example of this is the Faisal Settlement Project in Haradh, south-west of the Eastern Province.. The scheme was signed in September 1964, and it planned for one large village and eight small villages to provide farm plants for 1,000 families who consisted probably of 8-10 persons.[21]). The estimates of population change from 1962-63 to 1972-73 are urban to 289,514; rural to 96,477; and nomad to 75,931. (See Table 4.35 and Figure 4.10 showing the estimated mid-year increase from 1962-63 to 1982-83 in urban, rural and nomad areas.

TABLE 4.35
MID-YEAR INCREASE OF POPULATION FROM 1962-63 TO 1982-83

Element	1962-63	1967-68	1972-73	1977-78	1982-83
Urban	226,169	225,889	289,514	327,559	370,603
Rural	75,367	85,271	96,477	109,155	123,499
Nomad	59,316	67,111	75,931	85,909	97,198
TOTALS	360,852	408,271	461,922	522,623	591,300

Source: Population Survey in the Province 1962-63; 2.5% annual growth assumed for all sections of the population.

As has been pointed out, these estimates of the future population are only approximate. In the case of the nomad population in particular, the figures are almost certain to be considerable over estimates. The nomads are losing numbers continually by migration to urban and rural communities, which seems likely to continue into the foreseeable future as the pull of better living conditions and the push of the hard desert life are maintained. Moreover, the nomads are being encouraged to settle; and so, not only will the increase rate of the nomads be much lower than that of the rest of the population, but it is even possible that they may begin to decrease at some future date. It is impossible, however, to attach a reliable figure to their future rate of population change and thus to give an alternative prediction which would be better than that based on the assumed rate of 2.5%.

The Urban Sample Survey

In the absence of detailed census data, and since some of the urban settlements of the Eastern Province have only come into existence over the last 25 years, it was necessary in association with other urban survey work, to attempt population sample survey of immigration and given the need for selectivity the two new cities Al-Khobar and Dammam, which all general observation shows are the fastest growing centres to which a great deal of immigration is occurring, were chosen.

As both these cities are the main, newly established urban centres in the Eastern Province, it is logical that they would become the targets of the immigrant population, as they are the nucleii of the economic activity and the administration of the province, as well as being situated close to the industrial oil fields and Dhahran (the headquarters of the oil company). All these factors influenced my choice when selecting cities for the sample survey for the analysis in this study.

All other aspects of this study, e.g. of transport, industries etc., indicate that the older-established centres such as Hofuf and Qatif are

growing and diversifying to a very small extent compared with the newer towns and preliminary reconnaissance showed that from the immigration point of view numbers involved would be so small as not to be of great analytical value. It was therefore decided to concentrate on two newer towns, it also being apparent that there were likely to be significant differences even between these. Ideally all settlements should be studied but this is impossible for one individual and the selective choice had to be made on the basis of maximising the utility of feasible survey.

The population of these two cities is virtually new blood to the province; almost all are immigrants from different regions of the Eastern Province, from elsewhere in Saudi Arabia, and also from abroad.

The method followed in this analysis of population survey was dependent upon three main points: birth place; demographic characteristics and immigration.

(a) Birthplace: in this section the population was classified and identified with reference to the place of birth and to the region of family origin.

(b) Demographic characteristics: this is mainly concerned with age structure because in any non-official sample census the extreme reluctance in this region to give information concerning women and girls married or of marriageable age made it impossible to carry out the accurate study of sex ratios. The inhabitants of both cities are almost all relatively young people between the ages of 16 and 50; the average age in Al-Khobar is 33 and in Dammam it is 35, and this is due to the short space of time that these cities have been established.

(c) Immigration: the aim here was to discover the origin of migrants to both cities, under two classifications - old and new immigrants - and also the purpose of their migration. The size of the sample in both cities was 5,000 but the response rate to all questions of approximately 63% gave a final sample for analysis of 3,433.

The questionnaire used in this survey covered a wide variety of information such as population data, housing, transport, public services and shopping facilities. (See Appendix 1 and Introduction p.7)

Population in Al-Khobar and Dammam

The survey sample of population in Al-Khobar and Dammam may be divided into eight categories according to birth place, as follows:

A Those born in Al-Khobar and Dammam

B Those born in Al-Hasa region within the Eastern Province

C Those born in other regions within the Eastern Province

D Those born in Najid in the Middle Province.

E Those born in Hijaz in the Western Province

F Those born in Asir/Southern Region within Saudi Arabia (Southern Province

G Those born in other regions

H Those born abroad in Arab and other countries.

In the following analysis, only that part of the sample with a known birth place is considered, i.e. the sub-total in Table 4.36, except where the total sample is explicitly referred to.

TABLE 4.36
DISTRIBUTION OF SURVEY SAMPLE OF POPULATION ACCORDING TO BIRTH PLACE

Category	Al-Khobar		Dammam		Total	
	No.	% of Total	No.	% of Total	No.	% of Total
A	240	14.9	270	14.9	510	14.9
B	275	17.0	438	24.1	713	20.8
C	155	9.6	104	5.7	259	7.5
D	240	14.9	288	15.8	528	15.4
E	100	6.2	190	10.5	290	8.4
F	105	6.5	186	10.2	291	8.5
G	35	2.2	30	1.7	65	1.9
H	335	20.7	294	16.2	629	18.3
Sub-Total	1485	92.0	1800	99.0	3285	95.7
Unknown	130	8.0	18	1.0	148	4.3
TOTALS	1615	100	1818	100	3433	100

Source: Survey (Fieldwork)

The first point of note is that of the population of both cities,

TABLE 4.37

DISTRIBUTION BY % OF POPULATION BY BIRTH PLACE AND FAMILY ORIGIN

Category	Total		Known Birth Place	Birthplace same as Family Origin Region	%	Birthplace different from Family Origin Region	%	Total
	Nos.	%						
A	510	14.9	15.5	292	57.3	218	42.7	100
B	713	20.8	21.7	690	96.8	23	3.2	100
C	259	7.5	7.9	208	80.3	51	19.7	100
D	528	15.4	16.1	528	100	-	-	100
E	290	8.4	8.8	285	98.3	5	1.7	100
F	291	8.5	8.9	291	100	-	-	100
G	65	1.9	2.0	50	76.9	15	23.1	100
H	629	18.3	19.1	574	91.3	55	8.7	100
TOTALS	3285	95.7	100	2918	88.8	367	11.2	100

Source: Survey (Fieldwork)

only 15.5% of the known birth place sample was born within the two cities. 54.9% of their population was even born outside the Eastern Province (See Fig. 4.11, 4.12 and 4.13). Dammam and Al-Khobar are immigrant cities.

Secondly, an analysis of the family origins, both of those born in Dammam and Al-Khobar and of the immigrants, shows a considerable complexity of movement. (See Tables 4.37 and 4.38).

TABLE 4.38
DISTRIBUTION OF POPULATION SAMPLE BY BIRTH PLACE

Al-Khobar & Dammam	%	Within Province	%	Outside Province	%	Foreign Born	%	Total
510	10.5	972	29.6	1174	35.8	629	19.1	3285

Source: Survey (Fieldwork)

Al-Khobar and Dammam-born

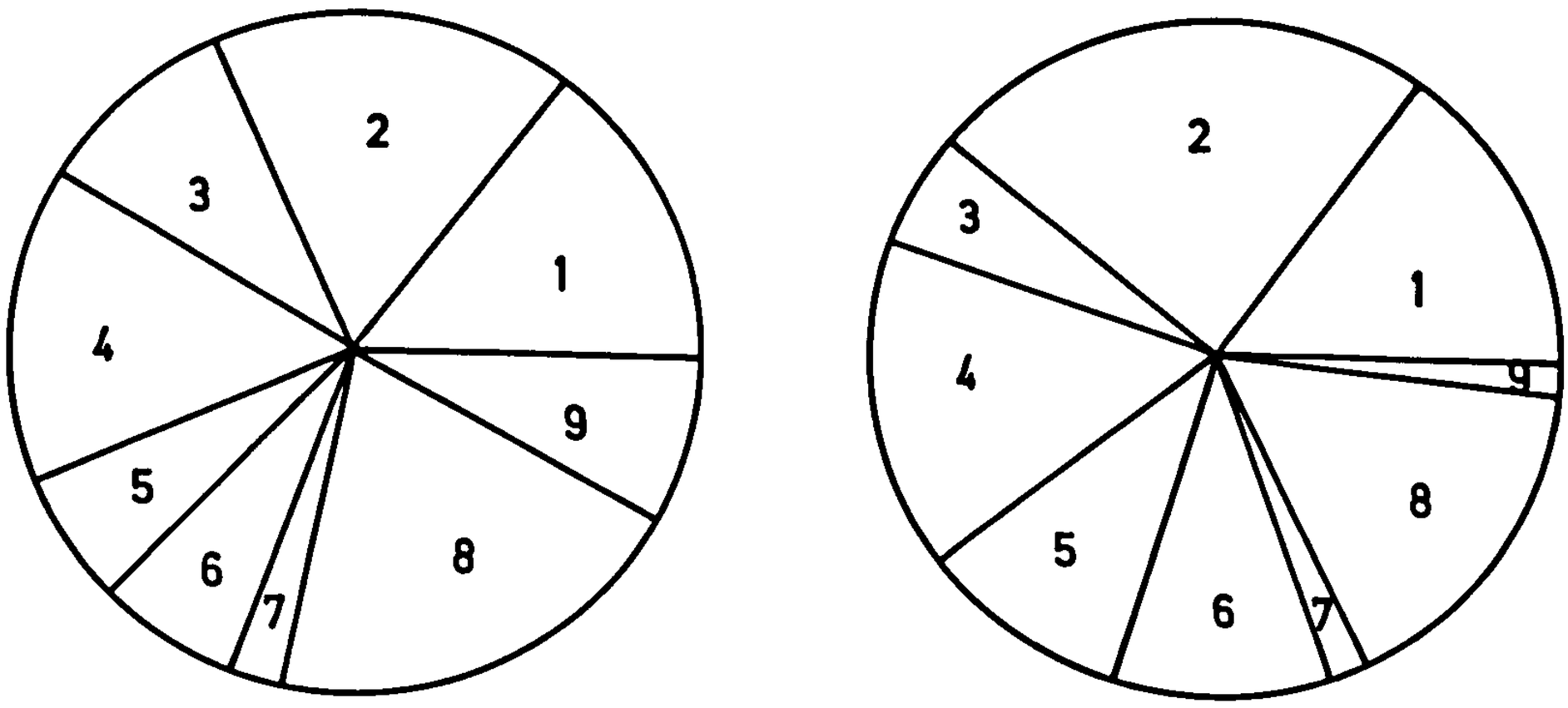
Category A, those born in Al-Khobar and Dammam, totalled 510, 14.9% of the total population sample; 218 (42.7%) of this category in both cities were born of immigrants for which Al-Khobar and Dammam were not the place of family origin. These people were from all the other groups, B-H. (See Old-comers to Al-Khobar and Dammam, pp.118 -120) on Immigration, and also Graph X Fig. 4.14).

Al-Hasa Born (Category B)

These comprised 713 (20.8%) of the total population survey sample; 96.8% of the Al-Hasa born were of Hasawi family origin and 3.2% were not from Al-Hasa families. This latter group were immigrants who came to Al-Hasa before the discovery of oil and remained when Al-Hasa was the main urban centre of the Eastern Province (See Graph B, Fig. 4.14).

Other Region born (Category C)

Category C made up 259 (7.5%) of the total population survey sample; 19.7% of Category C do not have family origins in the Eastern Province, but came from category groups D and F. Some of them probably settled down before the discovery of oil, being drawn by pearl fishing and trade between Arabia and India. For example, Al-Jubail, further north on the coast of the Gulf, was one of the places to which rich immigrants



Al-Khobar

① Al-Khobar born.
② Al-Hasa born.
③ Born in other regions of the Eastern Province.
④ Najid born.
⑤ Hijaz born.
⑥ Asir/Southern region born.
⑦ Born in other regions of Saudi Arabia.
⑧ Foreign born.
⑨ Unknown.

Dammam

① Dammam born.
② Al-Hasa born.
③ Born in other regions of the Eastern Province.
④ Najid born.
⑤ Hijaz born.
⑥ Asir/Southern region born.
⑦ Born in other regions of Saudi Arabia.
⑧ Foreign born.
⑨ Unknown.

FIG. 4.11. Al-Khobar and Dammam population by birthplace. (total sample)

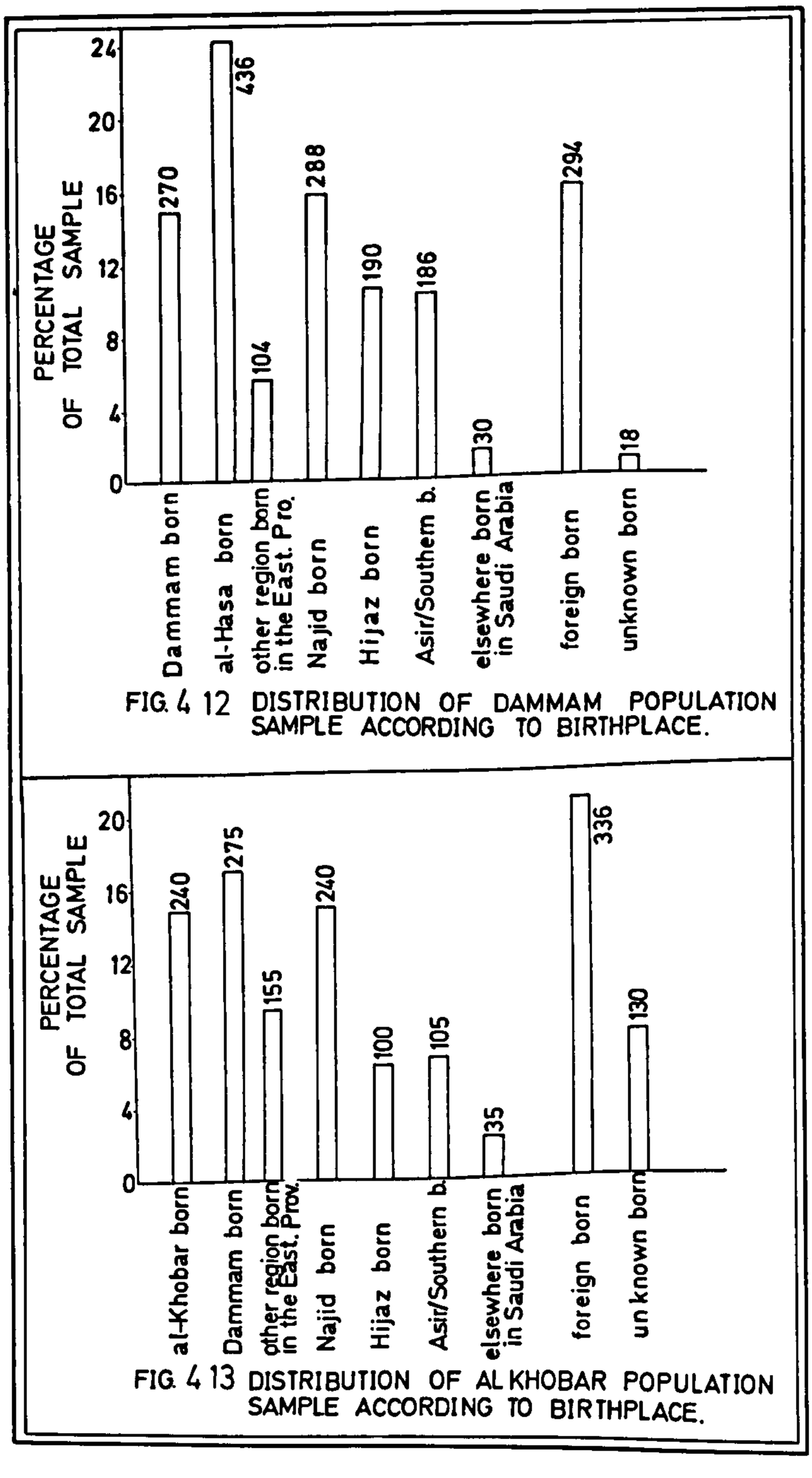


FIG. 4 12 DISTRIBUTION OF DAMMAM POPULATION SAMPLE ACCORDING TO BIRTHPLACE.

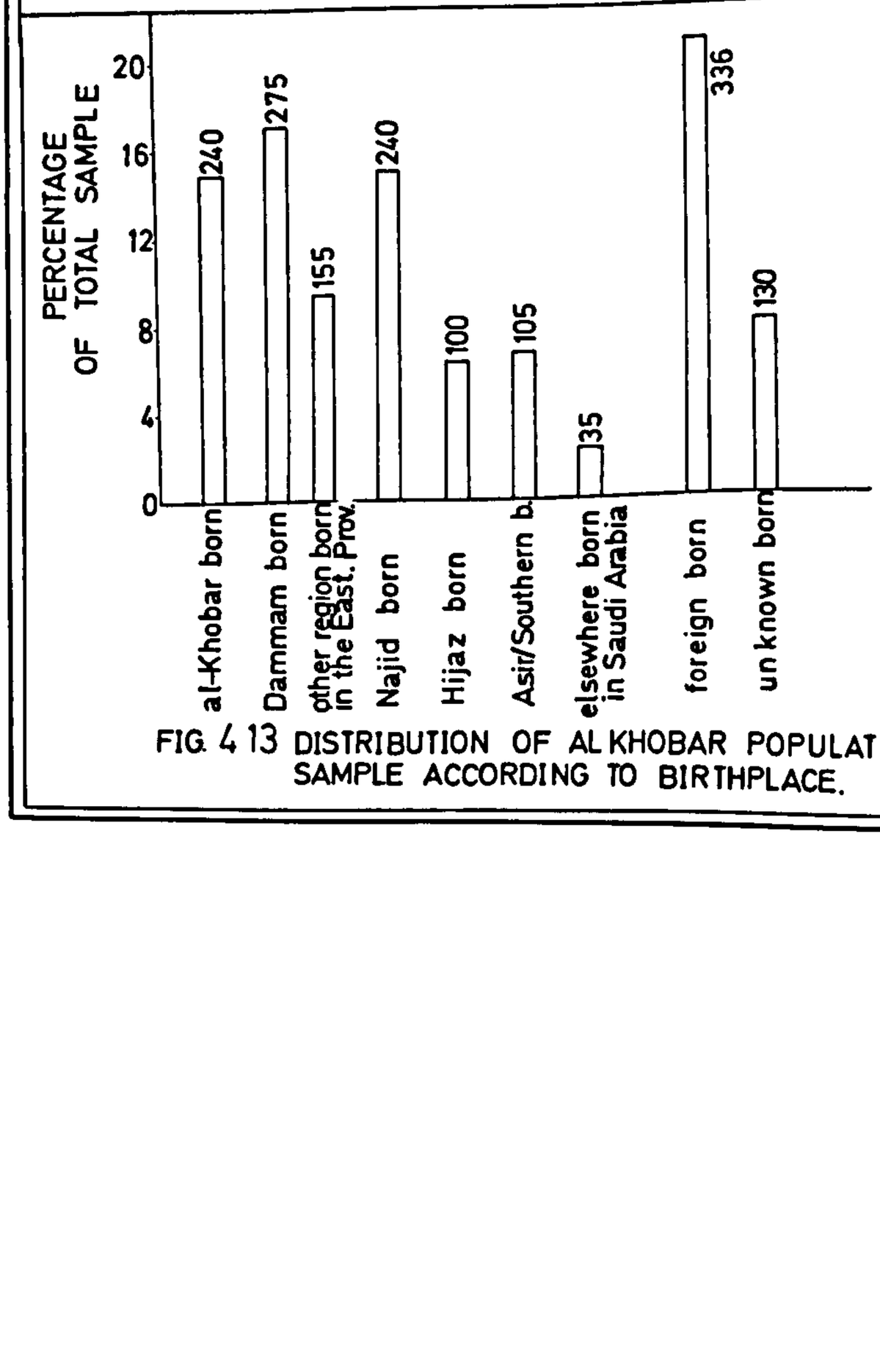
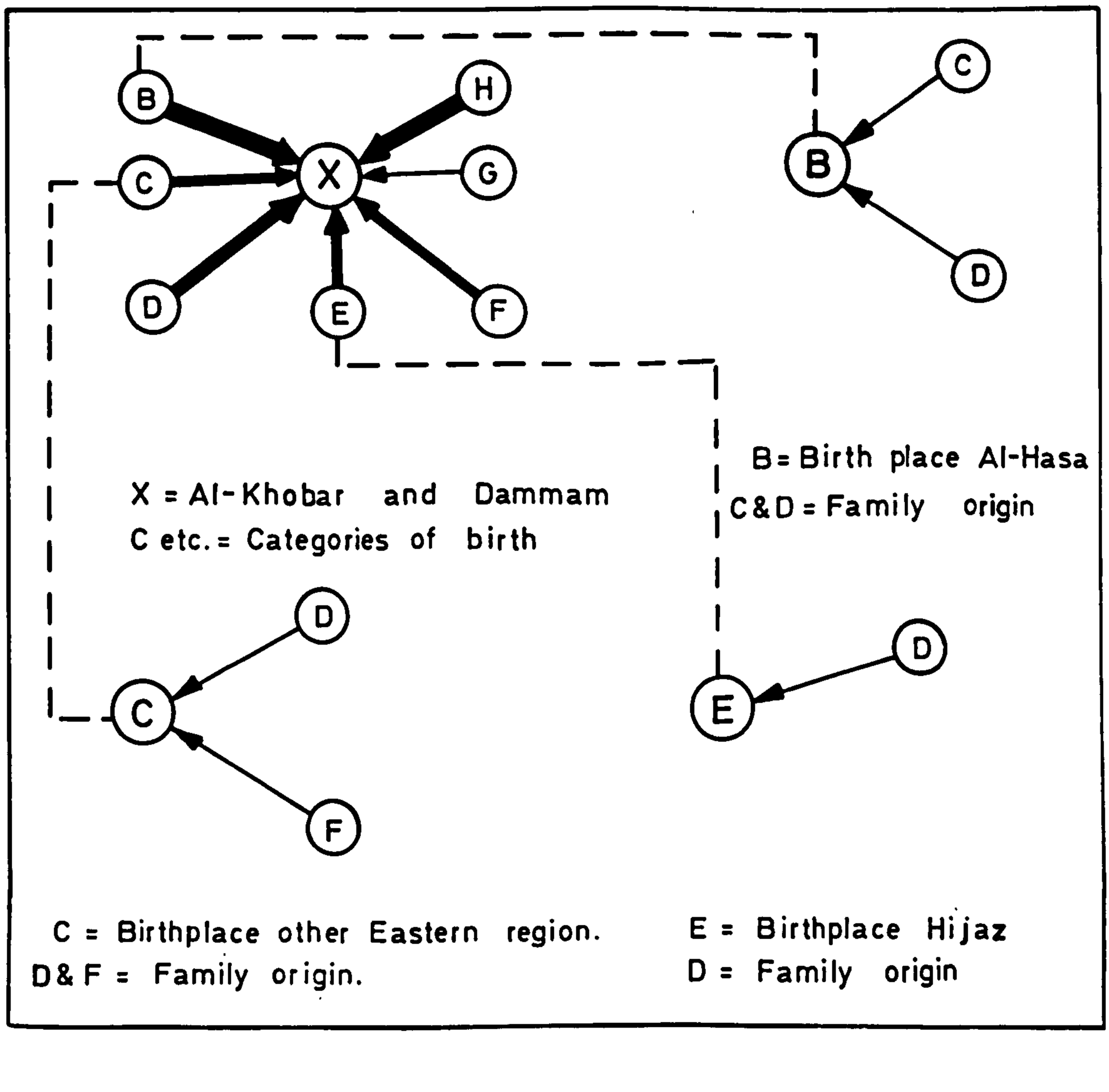


FIG. 4 13 DISTRIBUTION OF AL KHOBAR POPULATION SAMPLE ACCORDING TO BIRTHPLACE.

FIG. 4.14 . Illustrating birthplace and family origin of immigrants to Al - Khobar and Dammam.



came in the pre-oil period, and was a famous town for fishing in earlier years. 32.8% of the total Najid immigrants to the province came to Al-Jubail, some of them moving on again to Al-Khobar and Dammam during more recent immigration movements. (See Graph C, Fig. 4.14).

Najid and Asir born

Categories D and F made up 15.4% and 8.5% of the total population survey sample. These were born to families all of whom had resided in their original birth place.

Hijaz Region born

This cateogory E made up 8.4% of the total population survey sample. Category E of almost similar to groups D and F, i.e. those who moved from their own and their families' birth place to Al-Khobar and Dammam directly. However, a small number (1.7%) of Hijaz-born people first emigrated from their birth place of Majid (Category D) to the holy city of Al-Medina Al-Monawara (See Graph E, Fig. 4.14).

Born in Other Regions

Category G of regions elsewhere in Saudi Arabia supplied 1.9% of the population survey sample. In Group G there were 76.9% who were born at their family origin region, and 23.1% who were not - these came from other regions in Saudi Arabia.

Those born Abroad

Group H - those born abroad - made up 18.3% of the total population sample. The people in this group came from Arabian Gulf countries, Arab countries and non-Arab countries. Group H has 8.7% of immigrants originally from regions and countries different from their families' birth place.

Generally the towns with the most unique and distinctive characters in population of the Eastern Province (with the exception of the oil towns) are Dhahran, Abqaiq, Rahimah and others, because these towns are completely new, and almost all their residents are employees of the oil companies. Overall, the immigrants have a majority of 83.8% in Al-Khobar and 85.0% in Dammam, and almost uphold the economy of the Eastern Province.

Demographic Characteristics

The specific characteristics of the population sample of the two cities with regard to sex and age is seen in Figures 4.15 and 4.16, and also in Table 4.30 and Table 4.40, showing the numbers and percentages of age groups in Al-Khobar and Dammam.

Age Structure and sex enumeration

The analysis of age groups can be made only for males in most cases. This is because a non-official enumerator is only able to obtain limited co-operation in the sensitive area of female population. It was possible to obtain data for girls and young women 20 years or younger only, e.g. the unmarried female population and children.

Al-Khobar and Dammam Population - Sample Age

The pyramids, (fig.4.16 and 4.17) show the age structure of the population sample in both cities. Al-Khobar pyramid was virtually identical to that for Dammam, reflecting the similarity in the urban-isation and general population characteristics (See also Fig.4.17). The pyramids of the two towns are characterised by a broad base at the 0-5 age level, and with other 5-year categories only half as large to the age of 30. The category 25-30 is the largest in Dammam (See Table 4.39 and 4.40). In the case of Al-Khobar the marked disparity between 0-5 and all other 5-year categories is continuous up to the ages of 40-45. The marked discrepancy between the numbers of children aged between 0-5 years and those of 5-10, 10-15 and 15-20 years requires some comment. First, nothing in the data suggests that the sampling technique is itself responsible. Secondly, any explanation which relies on a very high mortality rate among young children is unsatisfactory because both of the cities have, in recent years, possessed excellent medical facilities and good services such as water supply. It therefore becomes most probable - although this cannot be tested without full female enumeration - that the large number of children aged 0-5 in 1973

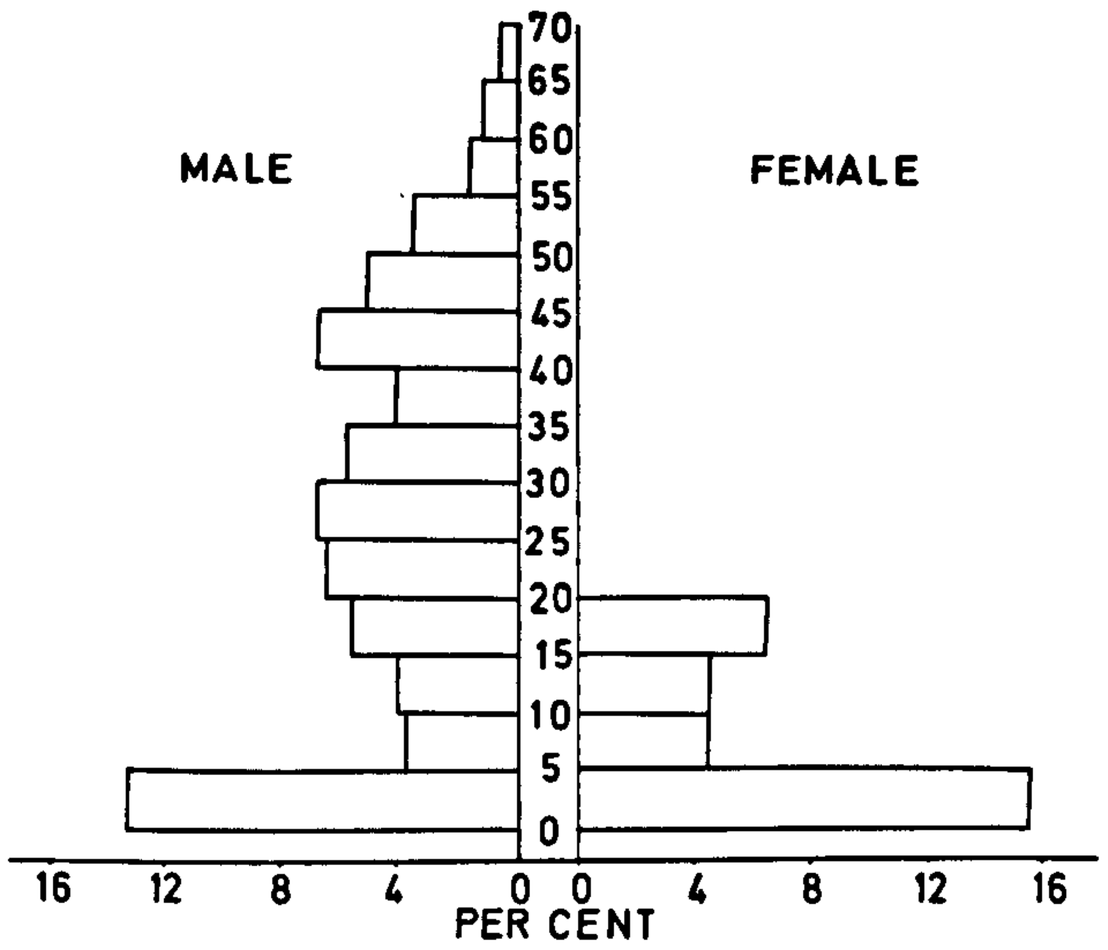


FIG. 4.15 AGE STRUCTURE OF AL-KHOBAR POPULATION.

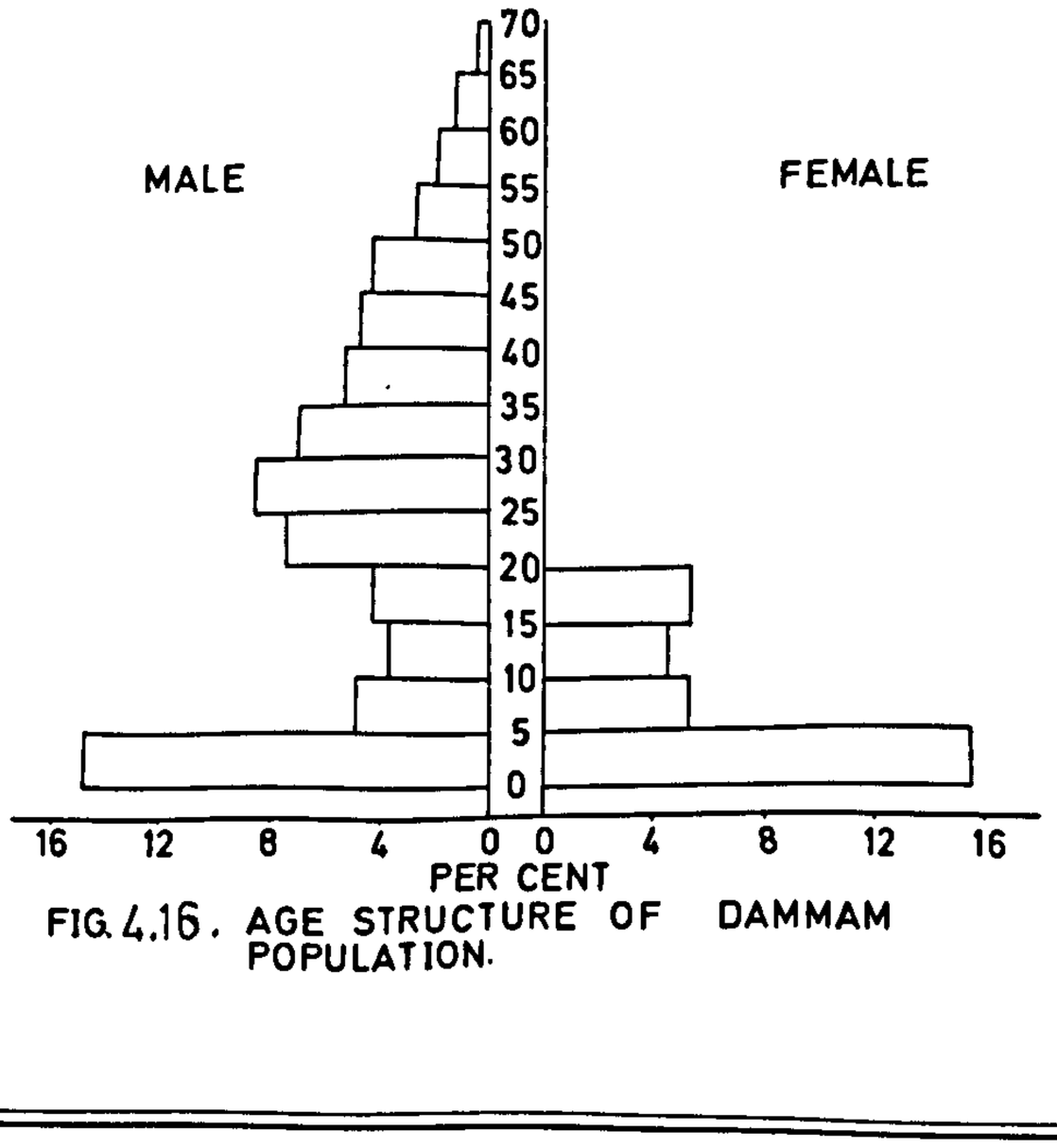


FIG. 4.16. AGE STRUCTURE OF DAMMAM POPULATION.

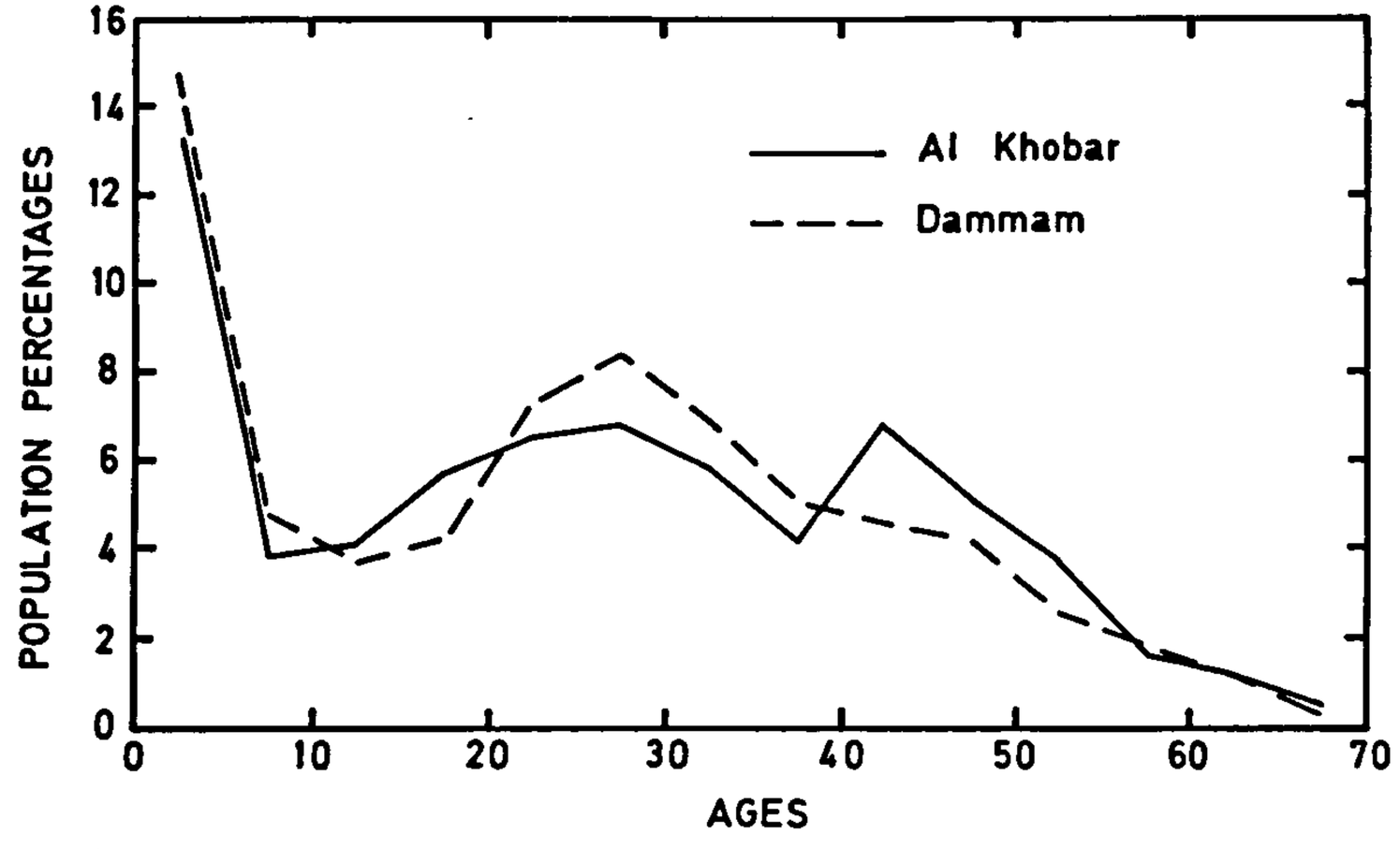


FIG.4.17 Age structure of the population sample in Dammam and Al-Khobar (male only)

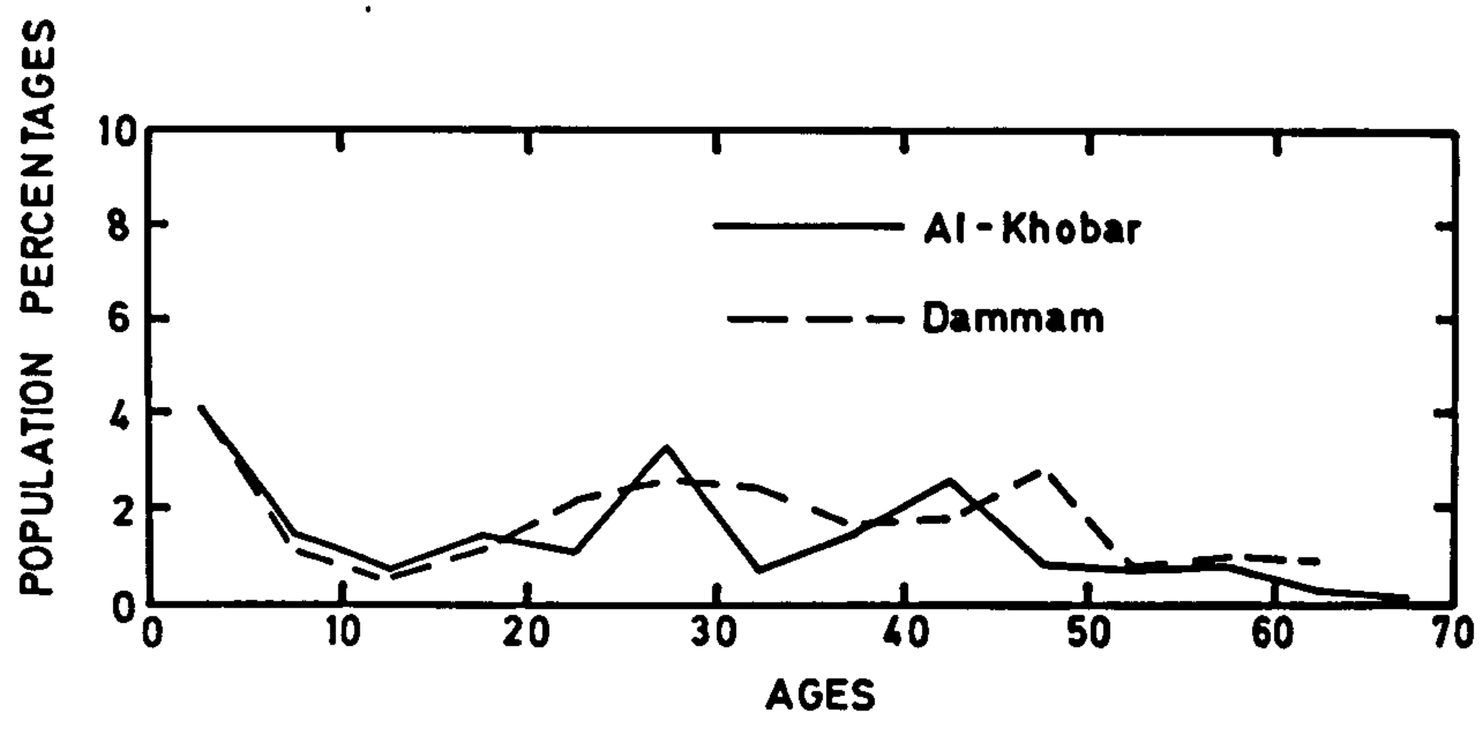


FIG.4.21 Age structure of the population sample in both cities of Al-Hasa born (male only)

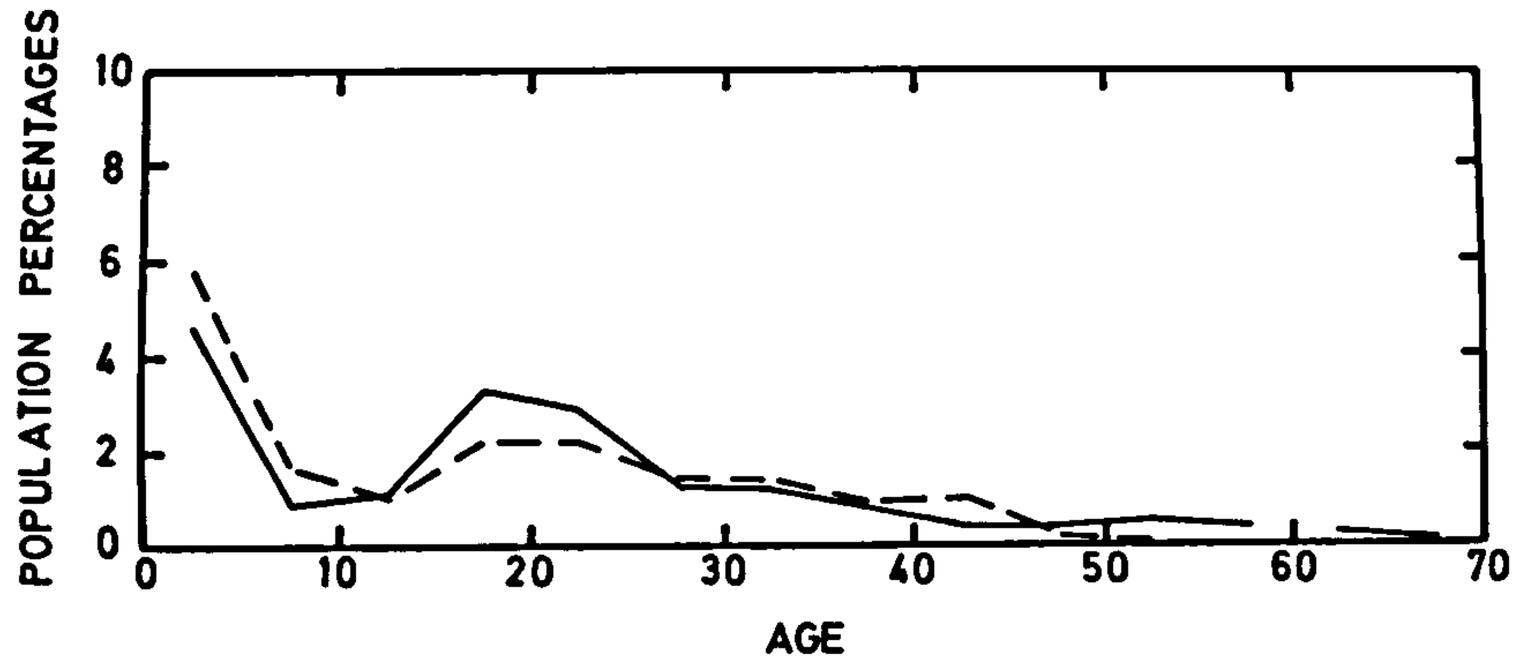


FIG.4.19 Age structure of the population sample in Al-Khobar and Dammam born (male only)

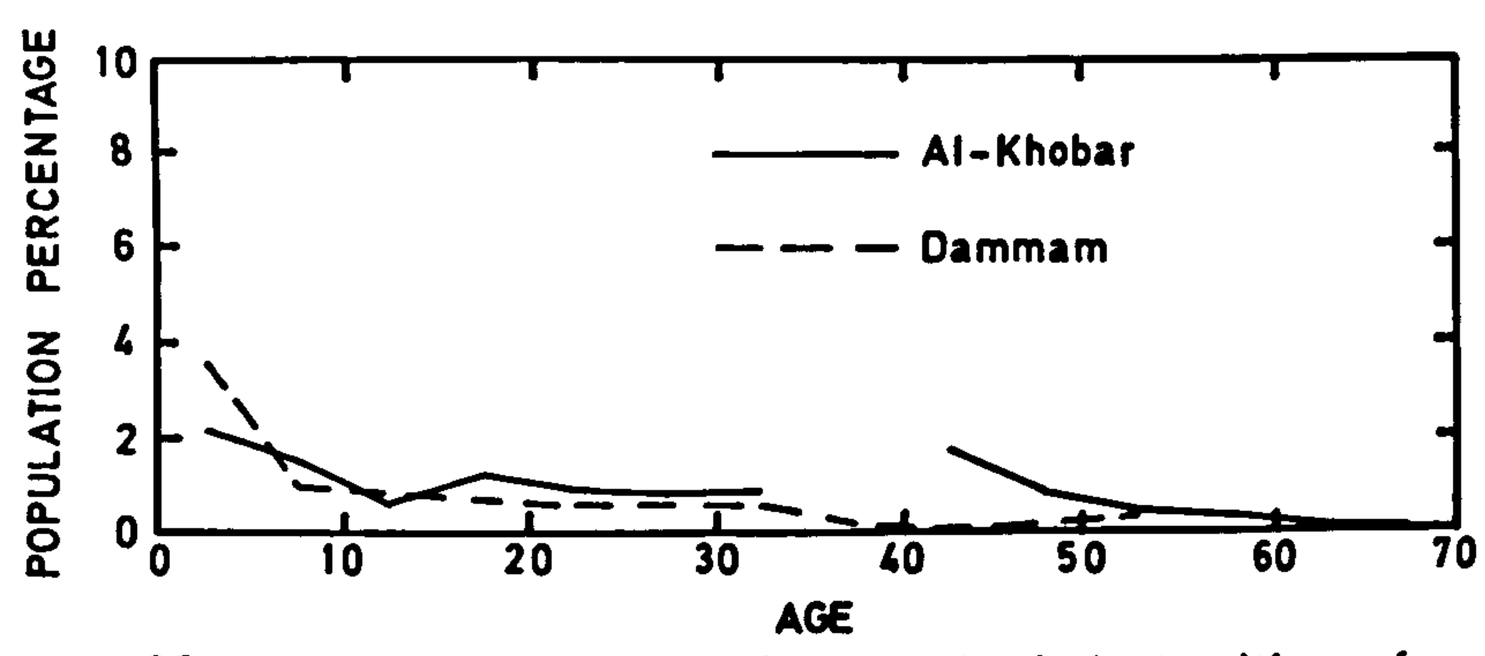


FIG.4.23 Age structure of population sample in both cities of other regions born of the eastern province (male only)

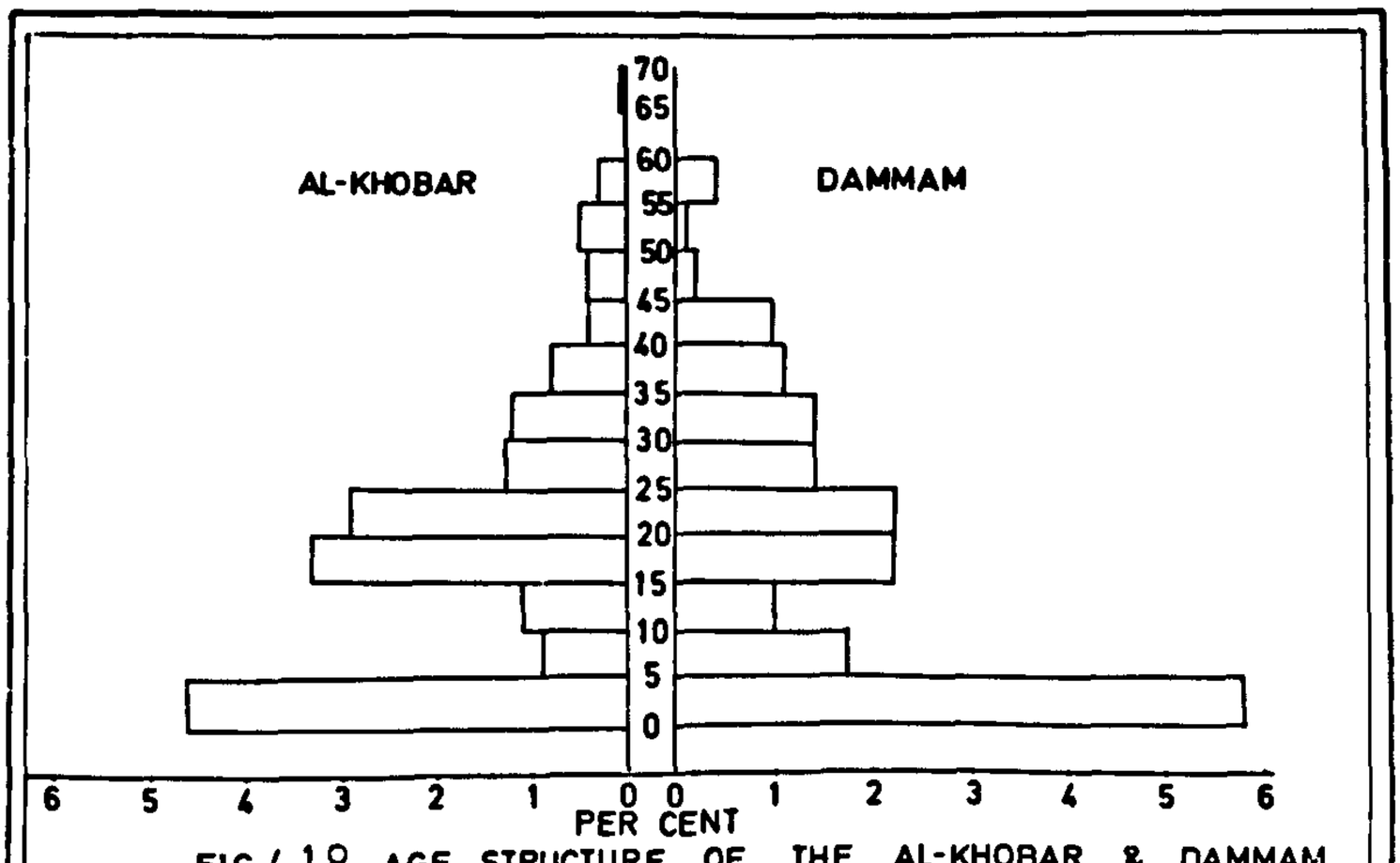


FIG.4.18 AGE STRUCTURE OF THE AL-KHOBAR & DAMMAM BORN. (MALE ONLY)

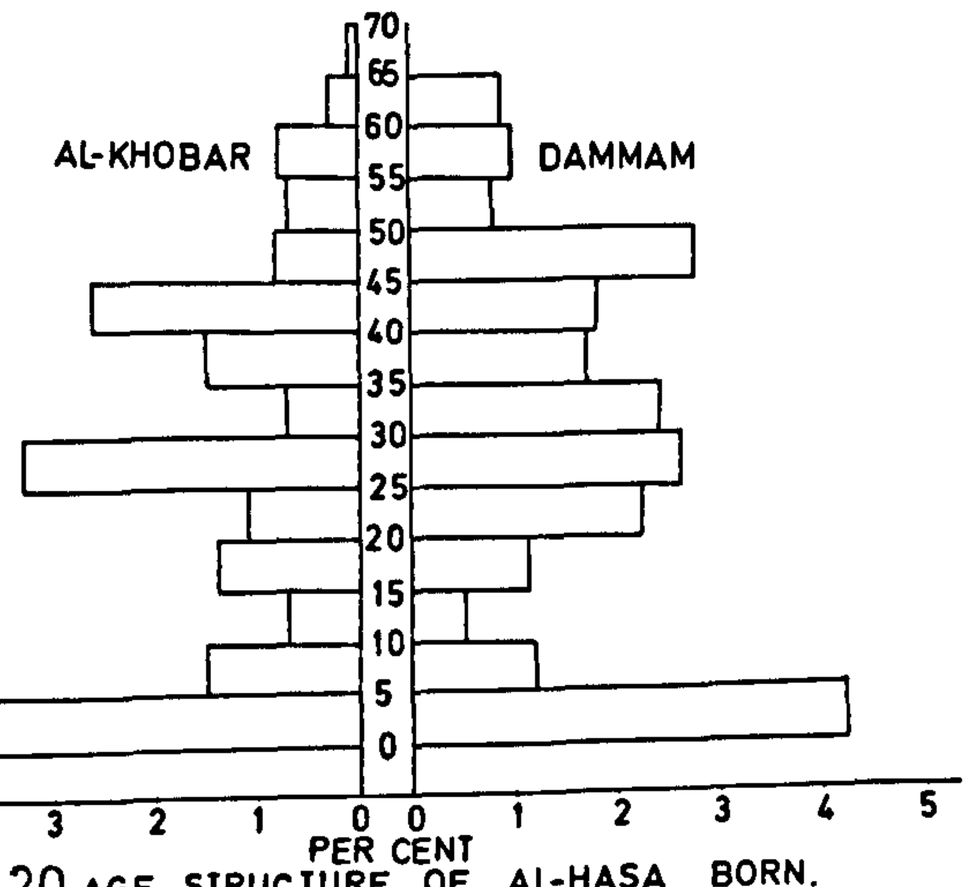


FIG.4.20 AGE STRUCTURE OF AL-HASA BORN. (MALE ONLY)

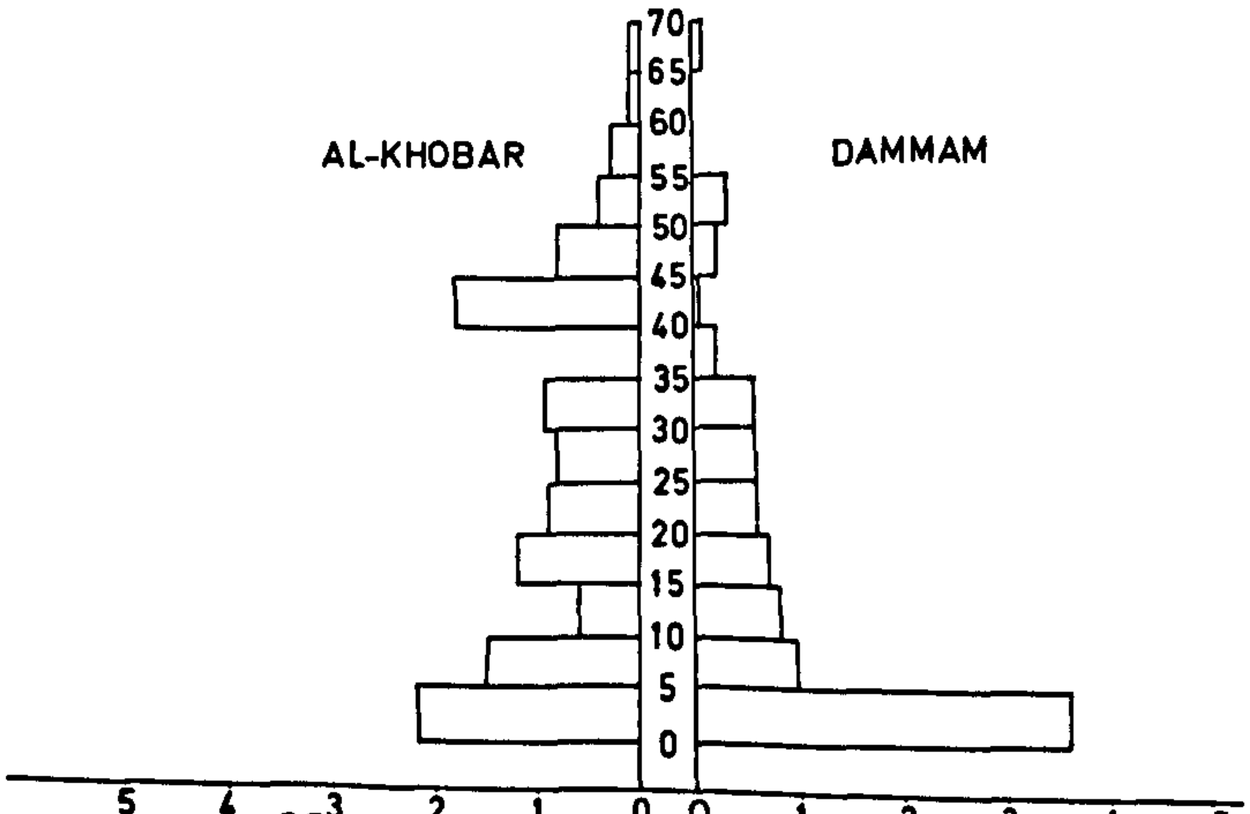


FIG.4.22 AGE STRUCTURE OF OTHER REGIONS BORN IN THE EASTERN PROVINCE. (MALE ONLY)

TABLE 4.39
DISTRIBUTION OF AGE STRUCTURE FOR THE POPULATION SAMPLE IN AL-KHOBAR (1973)

	0-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	Total
No. of male	380	107	116	161	184	195	164	120	194	145	106	49	33	18	1972
Percentage	13.3	3.8	4.1	5.7	6.5	6.8	5.8	4.2	6.8	5.1	3.7	1.7	1.2	0.6	69.3
No. of female	440	127	128	180	-	-	-	-	-	-	-	-	-	-	875
Percentage	15.5	4.5	4.5	6.3	-	-	-	-	-	-	-	-	-	-	30.7
TOTALS	820	234	244	341	184	195	164	120	194	195	106	49	33	18	2847

Source: Survey (Fieldwork)

TABLE 4.40
DISTRIBUTION OF AGE STRUCTURE FOR THE POPULATION SAMPLE IN DAMMAM (1973)

	0-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	Total
No. of male	525	171	132	152	260	300	248	182	164	152	92	64	42	12	2496
Percentage	14.7	4.8	3.7	4.2	7.3	8.4	6.9	5.1	4.6	4.2	2.6	1.8	1.2	0.3	60.7
No. of female	555	183	159	189	-	-	-	-	-	-	-	-	-	-	1086
Percentage	15.5	5.1	4.4	5.3	-	-	-	-	-	-	-	-	-	-	30.3
TOTALS	1080	354	291	341	260	300	248	182	164	152	92	64	42	12	3582

Source: Survey (Fieldwork)

TABLE 4.41

DISTRIBUTION OF AGE STRUCTURE BY PERCENTAGE IN AL-KHOBAR AND DAMMAM-BORN (1973)

	0-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	Total
Al-Khobar	4.6	0.9	1.1	3.3	2.9	1.3	1.2	0.8	0.4	0.4	0.5	0.3	-	0.05	17.6
Dammam	5.8	1.7	1.0	2.2	2.2	1.4	1.4	0.9	1.0	0.2	0.1	0.4	-	-	18.4
TOTALS	10.4	2.6	2.1	5.5	5.1	2.7	2.6	1.7	1.4	0.6	0.6	0.7	-	0.05	36.0

Source: Survey (Fieldwork)

TABLE 4.42

DISTRIBUTION OF AGE STRUCTURE BY PERCENTAGE BETWEEN AL-HASA BORN IN BOTH TOWNS (1973)

	0-5	6.10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	Total
Al-Khobar	4.2	1.5	0.7	1.4	1.1	3.3	0.7	1.5	2.6	0.8	0.7	0.8	0.3	0.1	19.6
Dammam	4.2	1.2	0.5	1.1	2.2	2.6	2.4	1.7	1.8	2.8	0.8	1.0	0.9	-	23.0
TOTALS	8.4	2.7	1.2	2.5	3.3	5.9	3.1	3.2	4.4	3.6	1.5	1.8	1.2	0.1	426

Source: Survey (Fieldwork)

reflects a relatively high birth rate in an immigrant population, and a population enjoying improved services and affluence in the years immediately preceding. For further comment see Al-Khobar and Dammam born Age Groups.

Al-Khobar and Dammam-born (Ages)

In the comparative age pyramid in Figure 4.18 and in Table 4.41 the categories show the similarity and differences in age structure between those born in the two towns. There is a difference in age 0-10 and a similarity in the 11-15 age group at both towns, while the 16-25 age group is higher in Al-Khobar than in Dammam. The small number in the age groups 11-15 and to a lesser extent 6-10 in both towns are due to an interesting social phenomenon. Newcomers sent their wives home for the birth of a baby during the earlier days of the existence of the new towns, because the facilities for medical care in those early days were not so good as now. As a result, for a key period in the towns' histories many children were recorded as born elsewhere. From the age of 21 onwards there is a rapid reduction up to the higher ages in both towns, with a gap of no recorded age numbers for the 61-65 age group in Al-Khobar (See Fig.4.19 and Table 4.41 showing the age percentages of Al-Khobar and Dammam of those between the ages of 11 and 70).

Al-Hasa born(Ages)

The age pyramid in Figure 4.20 and categories in Table 4.42 show the population structure of those born in Al-Hasa, and who live in both towns. The similarity was clear in the age group 10-20; the Al-Hasa of Al-Khobar were characterised by a wide structure with two peak groups of ages 26-30 and 41-45, the other groups of ages being in varying numbers, and reducing at the higher age level. The Hasawi of Dammam were different in structure from Al-Khobar, and were characterised by

a wide structure in four age groups - 21-35 and 46-50. In Dammam there is no record of those between the ages of 66 and 70.

In a comparison between the two cities, in Al-Khobar the graph of age differences from 16-60 remains controversial (See Fig.4.21) and no satisfactory reasons for the differences can be given.

Other Regions of the Eastern Province -(Ages)

Figure 4.22 and Table 4.43 show the pyramid age structure of those born in other towns or villages within the Eastern Province. The structure of Al-Khobar is characterised by four large number groups between 0-10, 16-20 and 41-45, and the smaller age groups of 51-70. and a gap here at the ages of 36-40. At Dammam, the higher numbers are in the age group 0-10 and the other groups rapidly reduce fro 11-15; here there is a gap of no recorded numbers in the age group 56-60.

The graph of age difference shows an important point, that there are relatively more 0-10 and young adults at the age of 16-20 and young people at the age of 26-35, and also higher numbers in age group 41-45 in Al-Khobar than in Dammam. (See Fig.4.23).

Other Regions - born within Saudi Arabia

The pyramids 4.24, 26, 28, 30 of regions of Majid, Hijaz, Asir/ Southern and those born in other regions of Saudi Arabia and also pyramid 4.32 of those born abroad. These five pyramids and categories in Table 4.44 of Al-Khobar and Table 4.45 of Dammam show the main age groups in each region who have been residents of both towns.

In Figure 4.24 the pyramid of Najid-born is characterised by a wide structure of almost three age groups, while in Dammam there are four wide structure groups, with a gap showing no record of age number. In Fig.4.25 we see the difference between Al-Khobar and Dammam; both cities have a majority of Najid-born people aged between 0-5, 21-30 and 36-55, these being the most active ages in the towns.

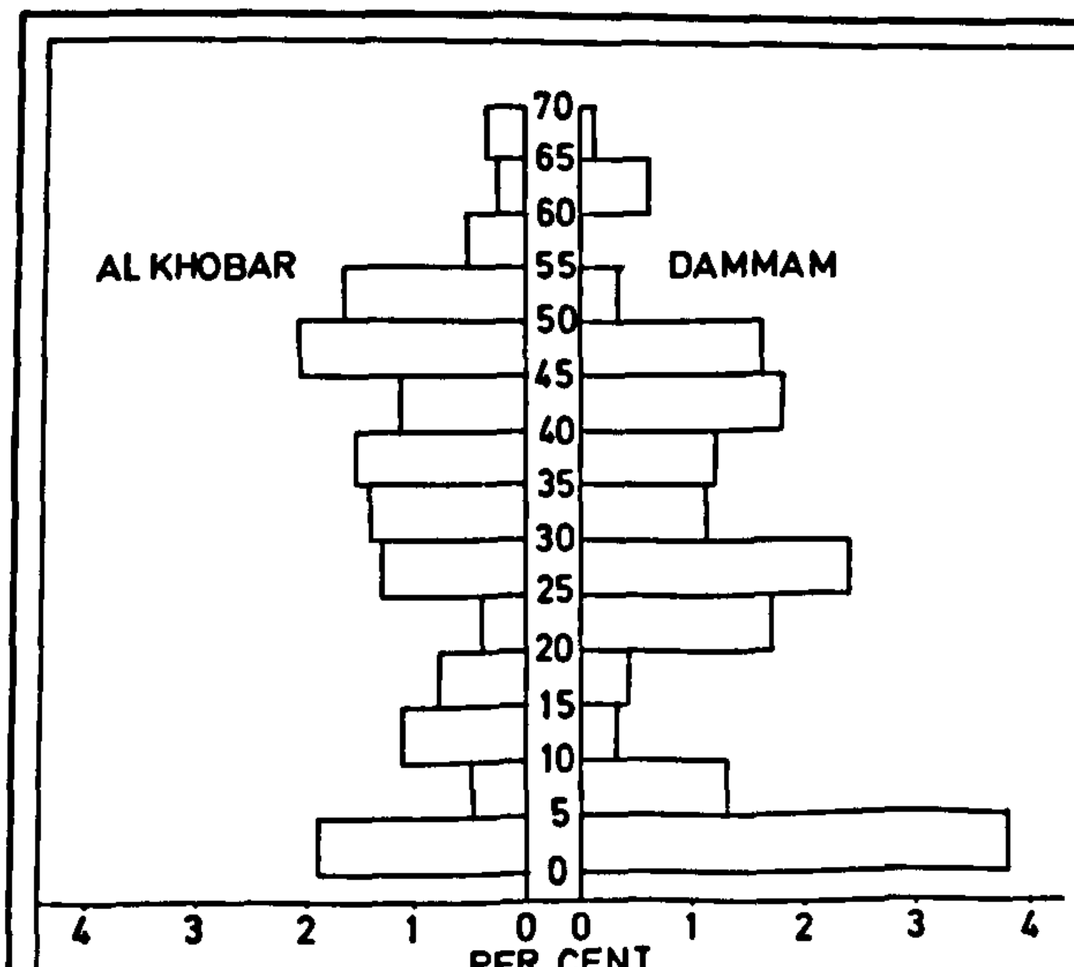


FIG 4.24 AGE STRUCTURE OF NAJID BORN (MALE ONLY)

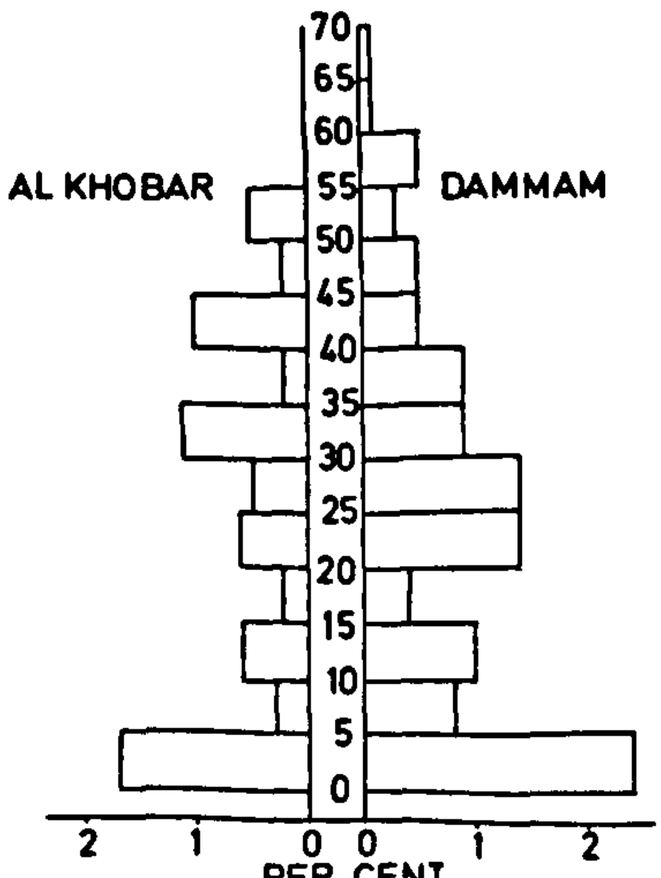


FIG 4 26 AGE STRUCTURE OF HIJAZ BORN (MALE ONLY)

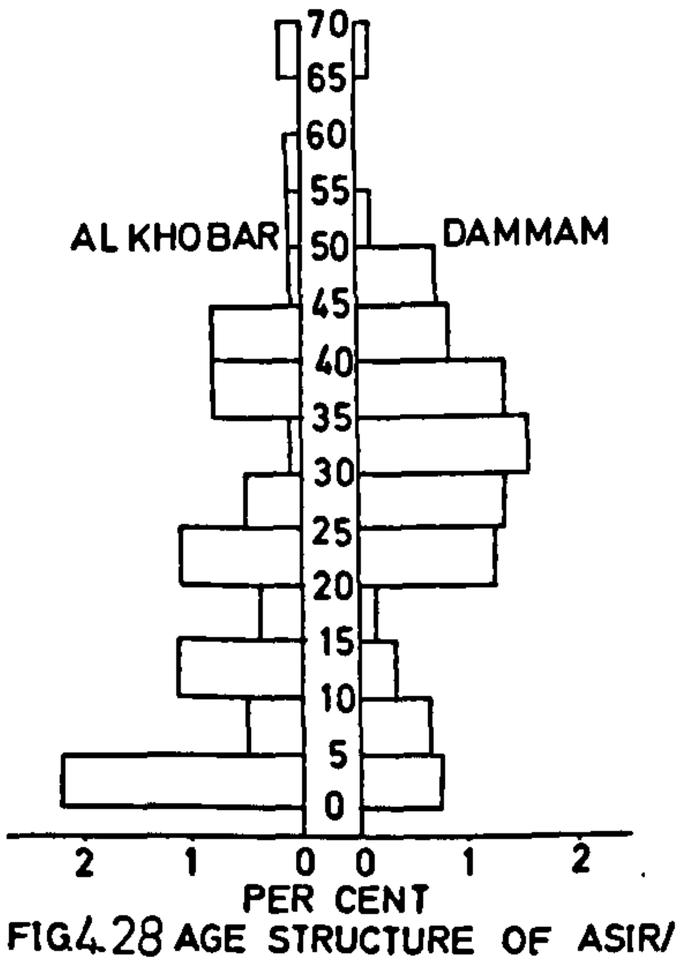


FIG 4.28 AGE STRUCTURE OF ASIR/ SOUTHERN REGIONS BORN. (MALE ONLY)

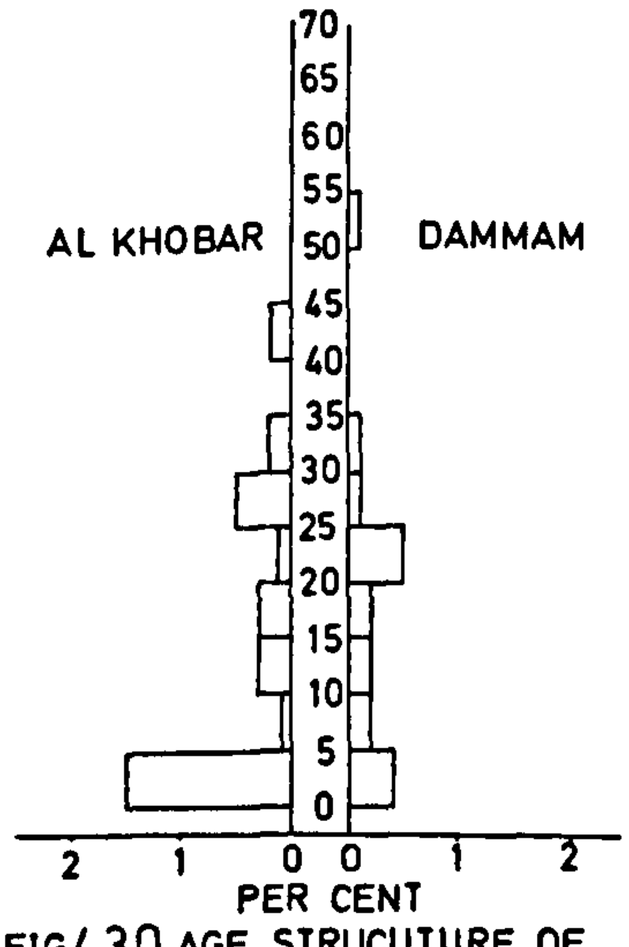


FIG 4.30 AGE STRUCUTURE OF ELSEWHERE BORN IN S.A. (MALE ONLY)

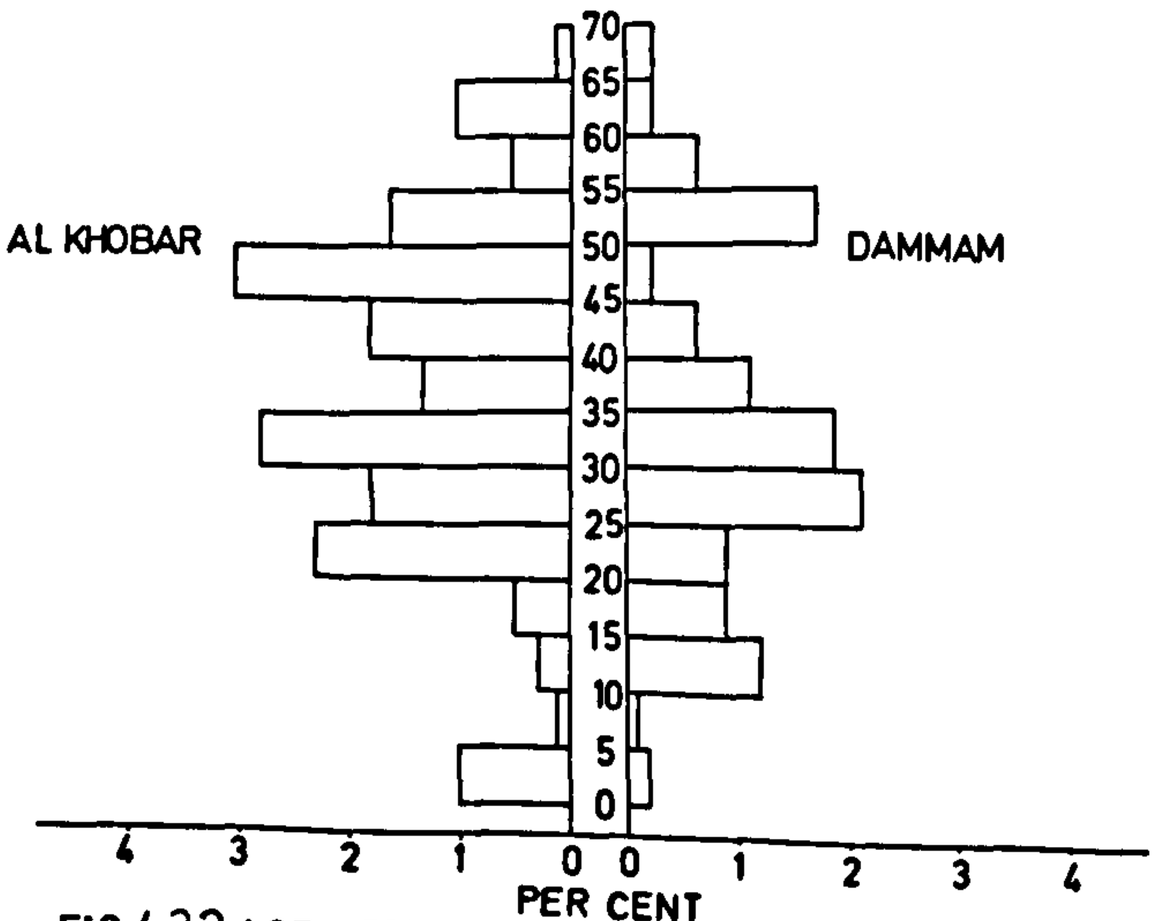


FIG 4.32 AGE STRUCTURE OF FOREIGN BORN. (MALE ONLY)

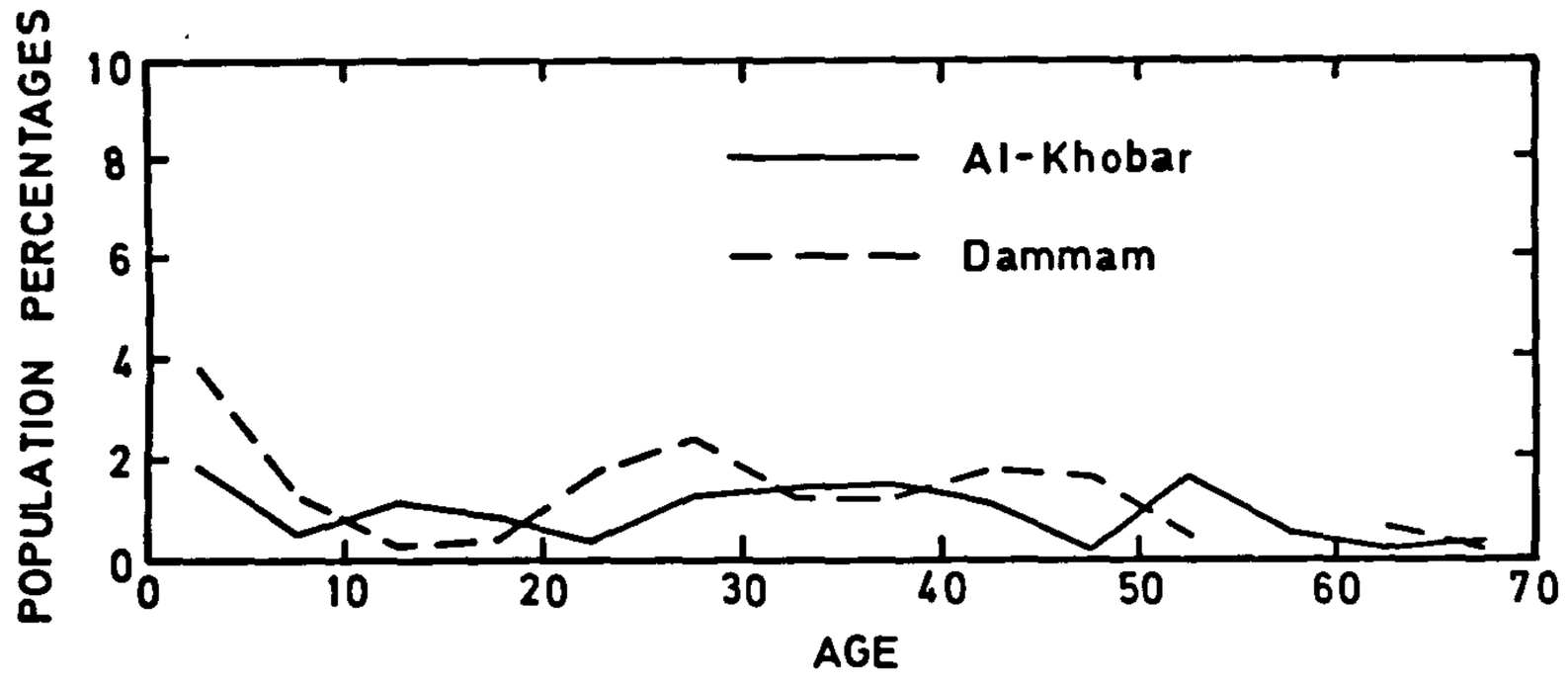


FIG. 4.25. Age structure of population sample in both cities of Najed born (male only)

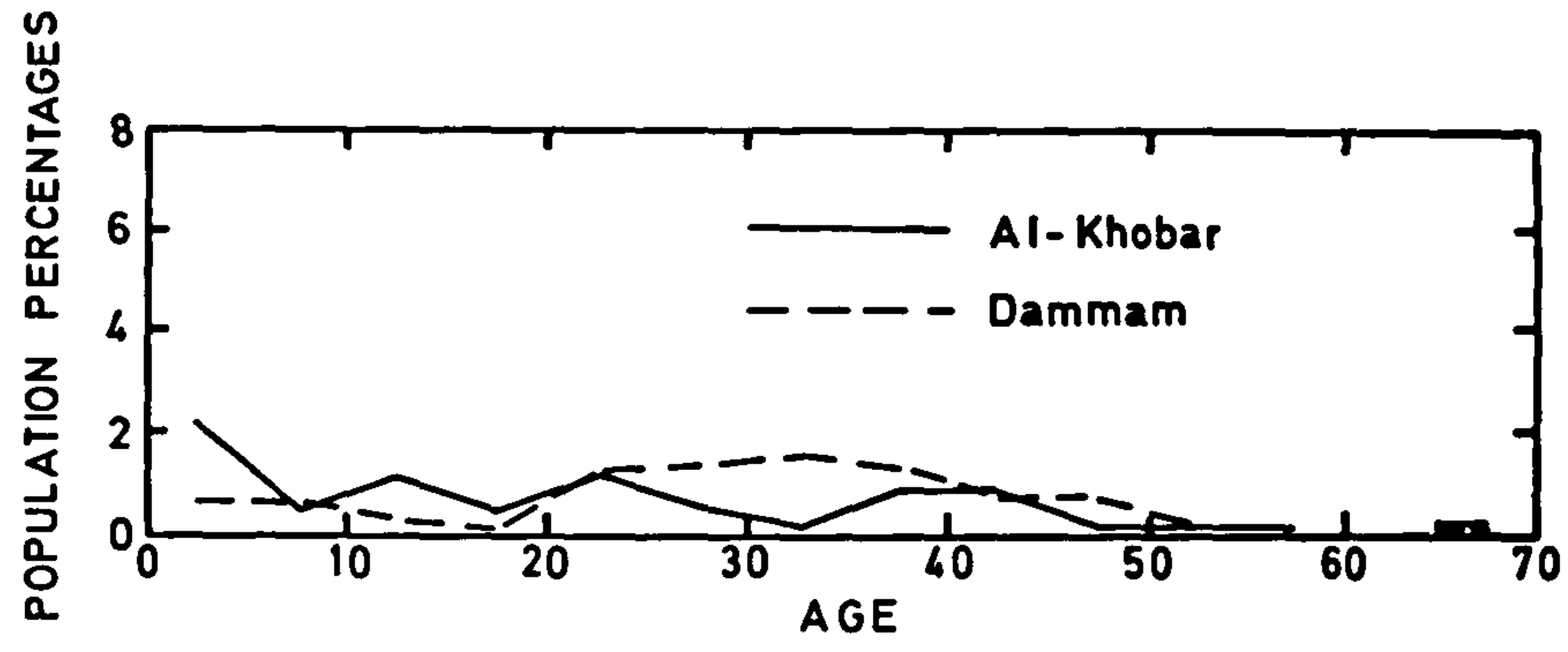


FIG. 4.29. Age structure of population sample in both cities of Asir/southern regions born (male only)

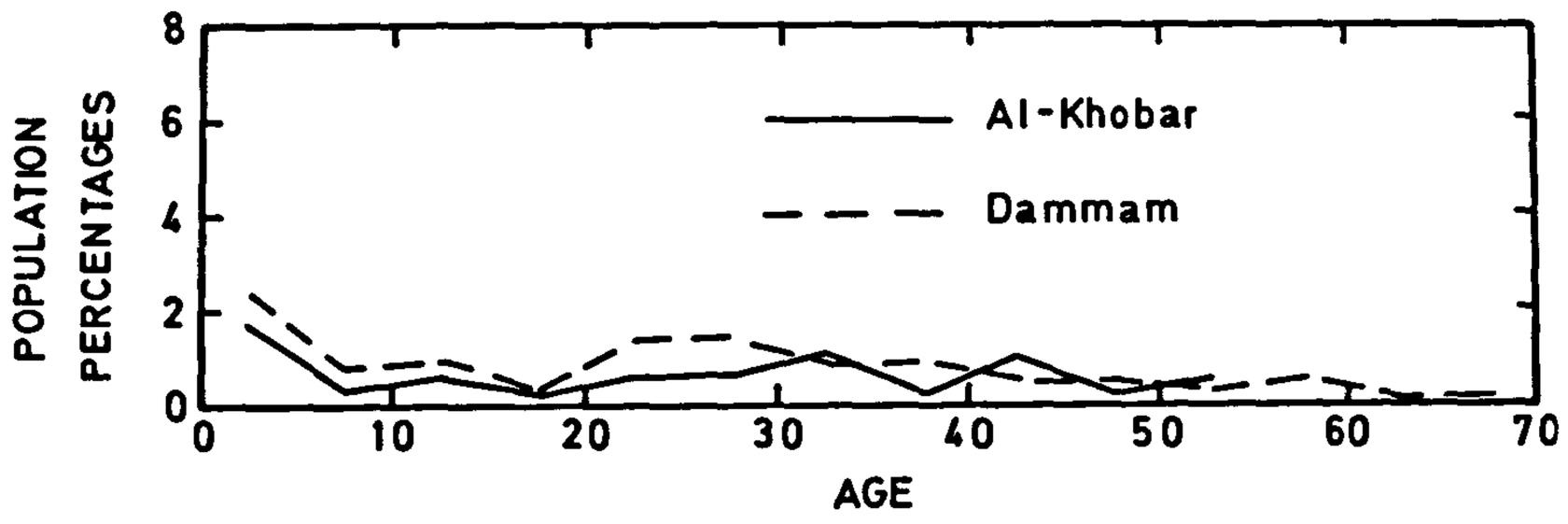


FIG. 4.27 Age structure of population sample in both cities of Hijaz born (male only)

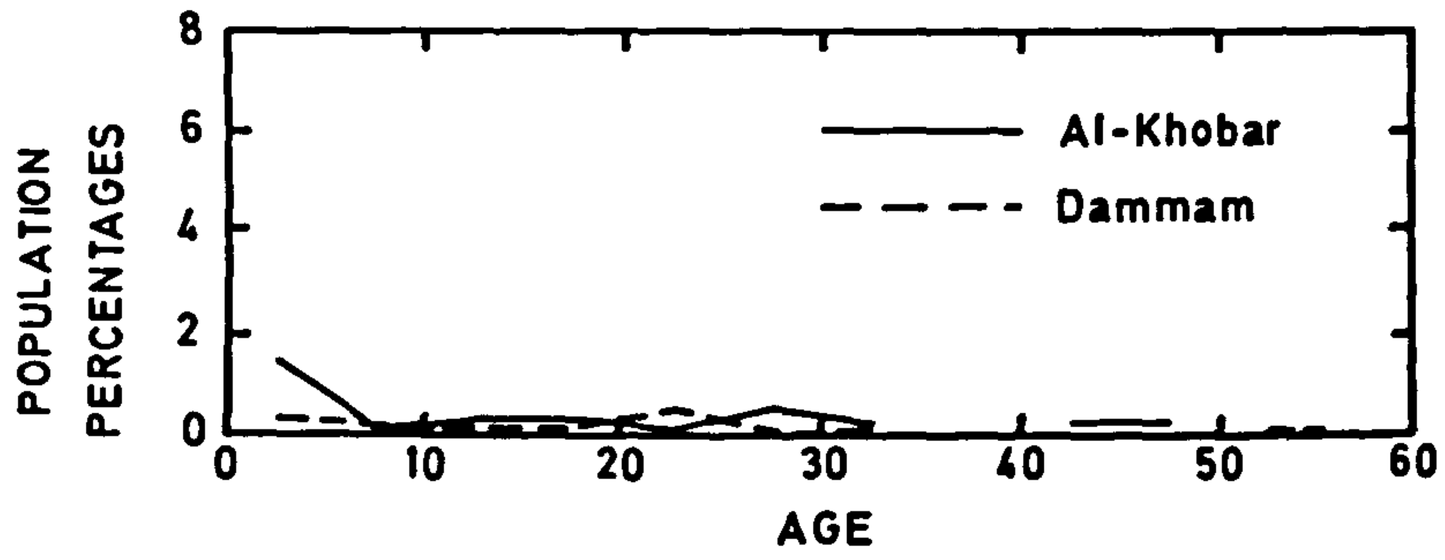


FIG. 4.31 Age structure of population sample in both cities of other regions born, within the Saudi Arabia (male only)

TABLE 4.43

DISTRIBUTION OF AGE BY PERCENTAGES BETWEEN OTHER REGIONS, BORN IN 1973 IN THE EASTERN PROVINCE

	0-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	Total
Al-Khobar	2.2	1.5	0.6	1.2	0.9	0.8	0.9	-	1.8	0.8	0.4	0.3	0.1	0.1	11.6
Dammam	3.6	1.0	0.8	0.7	0.6	0.6	0.6	0.2	0.04	0.2	0.3	-	-	0.04	8.8
TOTALS	5.8	2.5	1.4	1.9	1.5	1.4	1.5	0.2	1.8	1.0	0.7	0.3	0.1	0.1	13.2

Source: Survey (Fieldwork)

TABLE 4.44

DISTRIBUTION OF AGE BY PERCENTAGE BETWEEN FIVE REGIONS BORN OF SAUDI ARABIA LIVING IN AL-KHOBAR IN 1973

Town	0-5	6-11	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	Total
Najid	1.9	0.5	1.1	0.8	0.4	1.3	1.4	1.5	1.1	2.0	1.6	0.5	0.2	0.3	14.5
Hijaz	1.7	0.3	0.6	0.2	0.6	0.5	1.1	0.2	1.0	0.2	0.5	-	-	-	7.1
Asir/South	2.2	0.1	1.1	0.4	1.1	0.5	0.1	0.8	0.8	0.1	0.1	0.1	-	0.2	8.1
Other regions	1.5	0.1	0.3	0.3	0.1	0.5	0.2	-	0.2	-	-	-	-	-	3.4
Abroad	1.0	0.1	0.3	0.5	2.3	1.8	2.8	1.3	1.8	3.0	1.6	0.5	1.0	0.1	18.1
TOTAL OF AL-KHOBAR POPULATION	19.3	5.4	5.9	8.2	9.3	9.9	8.3	6.1	9.8	7.3	5.4	2.5	1.7	0.9	100

Source: Survey (Fieldwork)

TABLE 4.45

DISTRIBUTION OF AGE BY PERCENTAGES BETWEEN FIVE REGIONS BORN OF SAUDI ARABIA LIVING IN DAMMAM (1973)

	0-5	6-11	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	Total
Najid	3.8	1.3	0.3	0.4	1.7	2.4	1.1	1.2	1.8	1.6	0.3	-	0.6	0.1	16.6
Hijaz	2.4	0.8	1.0	0.4	1.4	1.4	0.9	0.9	0.5	0.5	0.3	0.5	0.1	0.1	10.7
Asir/South	0.7	0.6	0.3	0.1	1.2	1.3	1.5	1.3	0.8	0.7	0.1	-	-	0.1	8.7
Other regions	0.4	0.2	0.2	0.2	0.5	0.1	0.1	-	-	-	0.1	-	-	-	1.7
Abroad	0.2	0.1	1.2	0.9	0.9	2.1	1.9	1.1	0.6	0.2	1.7	0.6	0.2	0.2	12.1
TOTAL OF DAMMAM POPULATION	21.0	6.8	5.3	6.1	10.4	12.0	9.9	7.3	6.6	6.1	3.7	2.6	1.7	0.5	100

Source: Survey (Fieldwork)

The characteristics of those born in Hijaz region (Fig.4.26) are similar to those of people born in the region of Najid. There are two main age groups in Al-Khobar, 0-5, 31-35 and 41-45, and in Dammam there are four groups, 0-5, 11-15 and 21-30, the high number has increased with the 0-5 and the active age of people at both cities (See Tables 4.44 and 4.45). Figure 4.27 shows relatively small differences in age between both cities, whereas in Dammam the graph rises at the age 0-30 whilst in Al-Khobar it rises at ages 30-35 and 40-45, and reduces with the higher age groups.

In Asir/Southern, and other regions of Saudi Arabia a greater similarity in age groups 0-5, 20-25, 41-45 and 51-55 was apparent for both cities, and the difference is greater at age 0-5, 11-20, 26140 and 46-50 whereas the higher number is in the age group 21-40 in Dammam, but in Al-Khobar this is only evident at the age groups 0-5, 11-15 and 21-25 (Fig.4.28 and 4.29 show the age difference).

The pyramid showing those born in other regions shows the structure characterised by wide variation in both cities between the ages of 21-25 for Al-Khobar and 0-5 for Dammam, with a gap for both at age 36-40 in Al-Khobar and 36-50 in Dammam (see Fig.4.30 and Graph 4.31, and also Tables 4.44 and 4.45 of age distribution in regions of Saudi Arabia).

The pyramid (Fig.4.32) of those born abroad is characterised by six age groups, in Al-Khobar between the ages of 21-35 and 41-55 the higher structure being between the ages of 46-50, while in Dammam the structure is less high at the same age. The differences in ages here are very clear between both cities (see Graph 4.33), especially between the ages of 46-50 where the numbers were much higher in Al-Khobar than in Dammam.

The main aim in examining age structures is to discover the majority of ages in both towns. In Al-Khobar it was between 0-5 and

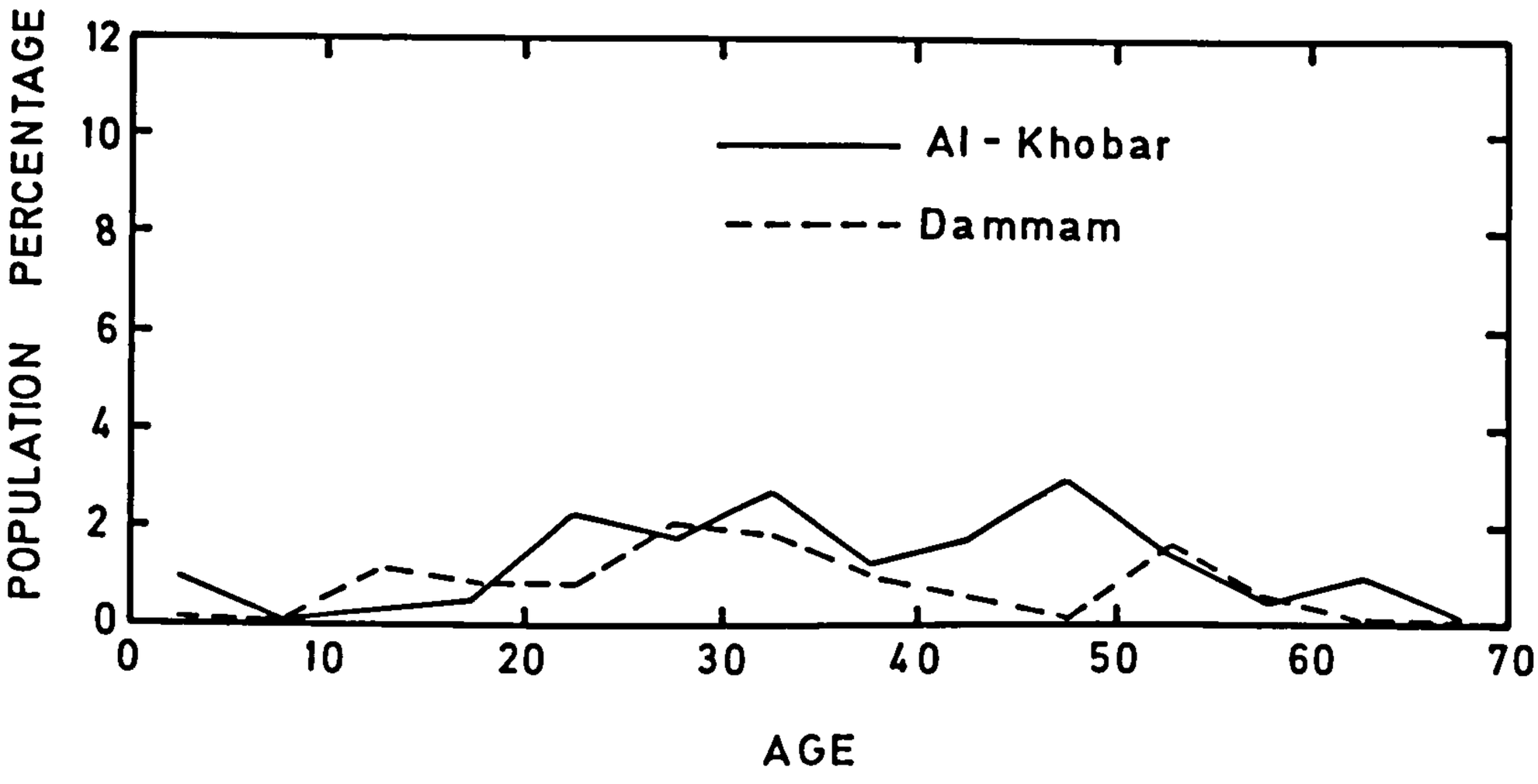


FIG. 4.33. Age structure of population sample in both cities of forein born. (male only)

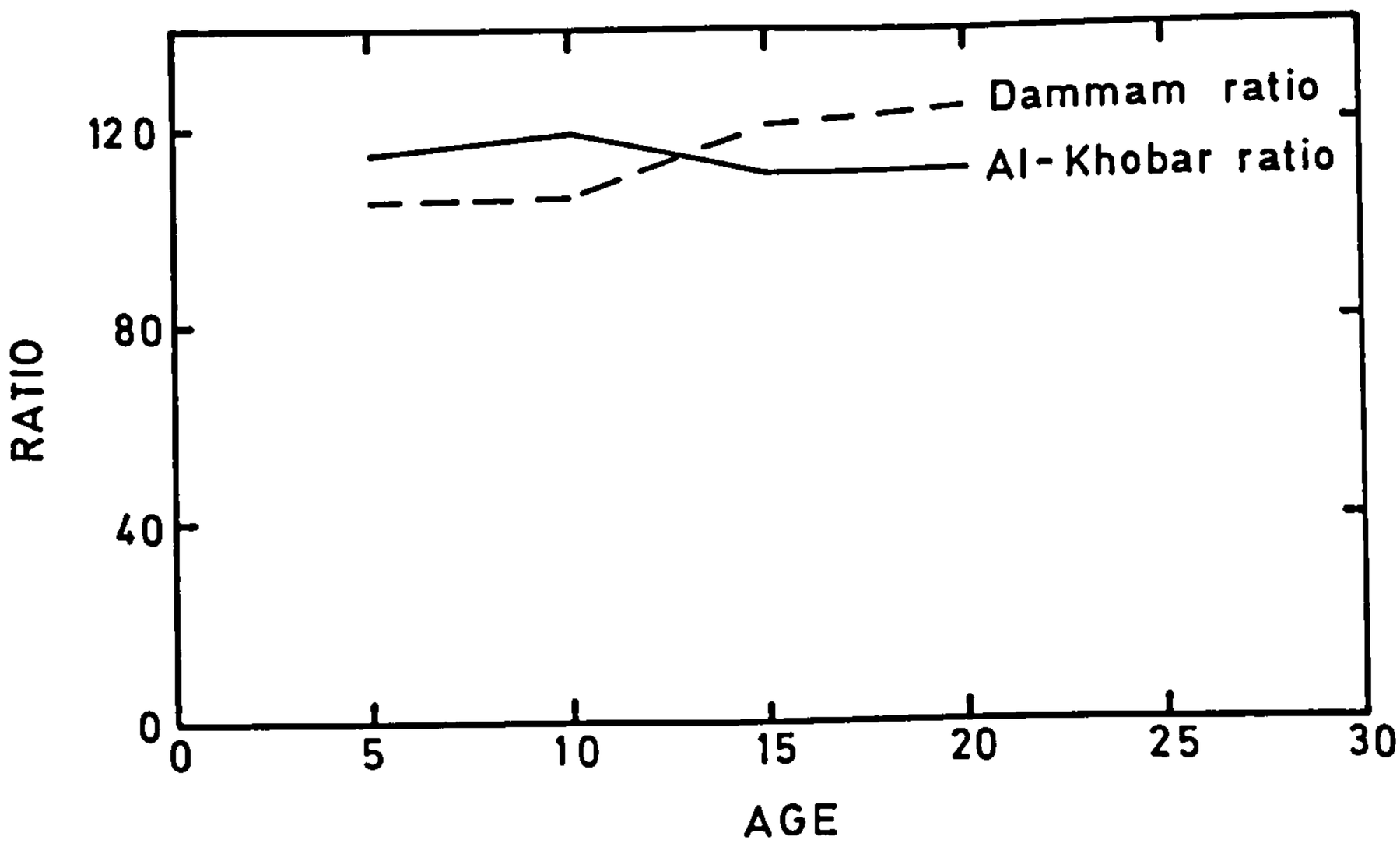


FIG. 4.34. Difference in sex ratio.

21 and 55; in Dammam between 0-5 and 21 and 50. The average age in Al-Khobar is around 32.7 years and in Dammam 34.8 years.

Differences in Sex Ratio

The differences in sex ratio can only be given for the 0-20 age group from data available from my personal survey during fieldwork. Between the ages of 0-20 these figures give more or less a reflection of the variety and differences of sex at both towns.

Referring to pyramids of age structure in Figures 4.15 and 4.16, a similarity is seen in the proportion of age between the two cities (see Graph 4.17, the population age structure). While the differences in sex between male and female differed from the sex ratio, (see Fig.4.34) this shows the sex ratio to be higher in Al-Khobar than in Dammam in the age group 0-10, and in Dammam the sex ratio is higher between the ages of 10-20, and the differences here between both towns are very small - about 0.9%. The ratio of sex was expressed by numbers of females per 100 males. The sex ratio is higher than 100 at both towns (see Table 4.46 showing the sex ratio, male and female, in both towns).

TABLE 4.46
SEX RATIO - FEMALE PER 100 MALE

Age	Al-Khobar	Dammam	% Difference
0-5	115.8	105.7	8.7
6-10	118.7	107.0	9.9
11-15	110.3	120.5	8.5
16-20	111.8	124.3	10.1
TOTALS	456.6	457.5	0.9

Source: Survey (Fieldwork)

Differences in Child/Adult Ratio

This is expressed as the number of children under 5 years old per 100 male adults between the ages of 25-40 years. In Al-Khobar the ratio is 79.3 male and 91.9 female. In Dammam the ratio is 71.9 male and 76.0 female; the figures were less than 100 in both towns, but showed a higher than 100 overall ratio. (See Table 4.47)

TABLE 4.47
CHILD/ADULT RATIO IN AL-KHOBAR AND DAMMAM

Town	Male	Female
Al-Khobar	79.3	91.9
Dammam	71.9	67.0
Percentage difference	9.3	17.3

Source: Survey (Fieldwork)

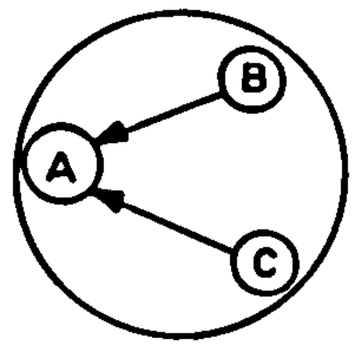
Immigration

Al-Hasa region in the Eastern Province has attracted many immigrants in its history, which has normally traditionally exerted a pull factor. However, after the discovery of oil, and particularly due to the movement in 1953 of the Eastern Province administrative centre from Al-Hasa (Hofuf town) to Dammam, Al-Hasa's attraction to immigrants fell. The pull factor of Al-Hasa was in fact changed to a push factor to the new centre of Dammam and Al-Khobar, the new urban centre of the Eastern Province; both towns received immigrants from Al-Hasa and elsewhere in the Eastern Province, and also from all regions of Saudi Arabia, in addition to immigrants from abroad. This mixture of people, together with the local inhabitants of both towns, make up the populations.

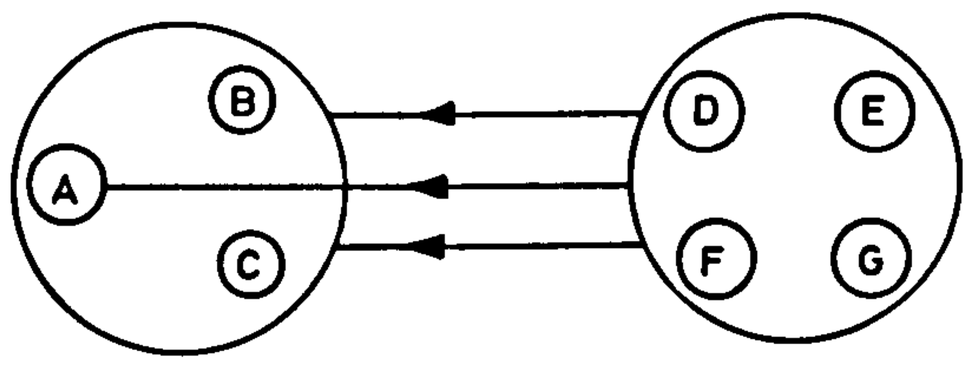
From the tables and figures showing the distribution of population in the survey sample, it can be seen that the specific characteristics of population differences stem from family origin and the active movement of immigrants from one region to another.

(a) within the Eastern Province - immigration to Al-Khobar and Dammam
(b) Within Saudi Arabian regions - immigration to the Eastern Province and the two towns;
(c) From abroad - immigration to Saudi Arabia - the Eastern Province and the two cities (See Fig. 4.35 showing the immigration system).

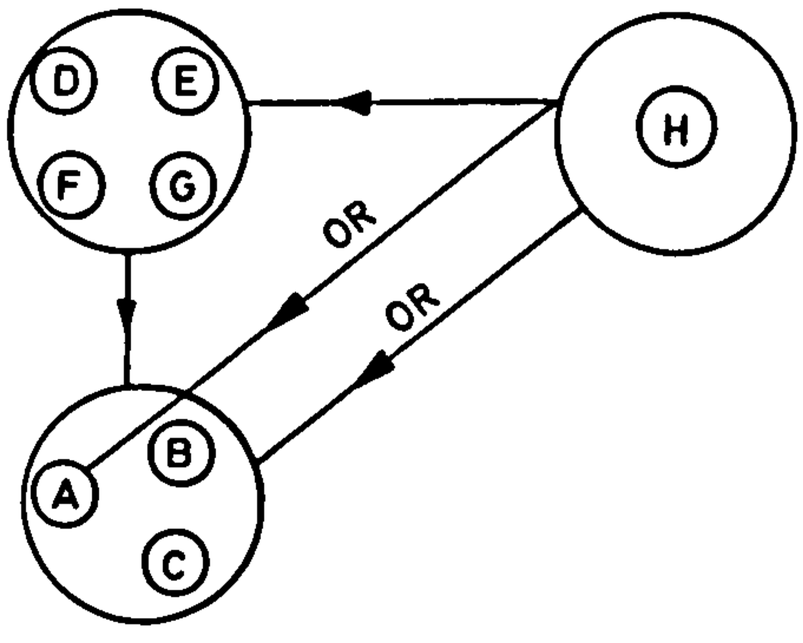
FIG. 4.35. The immigration system.



.i. Within the Eastern province.



.ii. Within the Saudi Arabian regions to the Eastern province.



.iii. From abroad to Saudi Arabia or direct to the Eastern province.

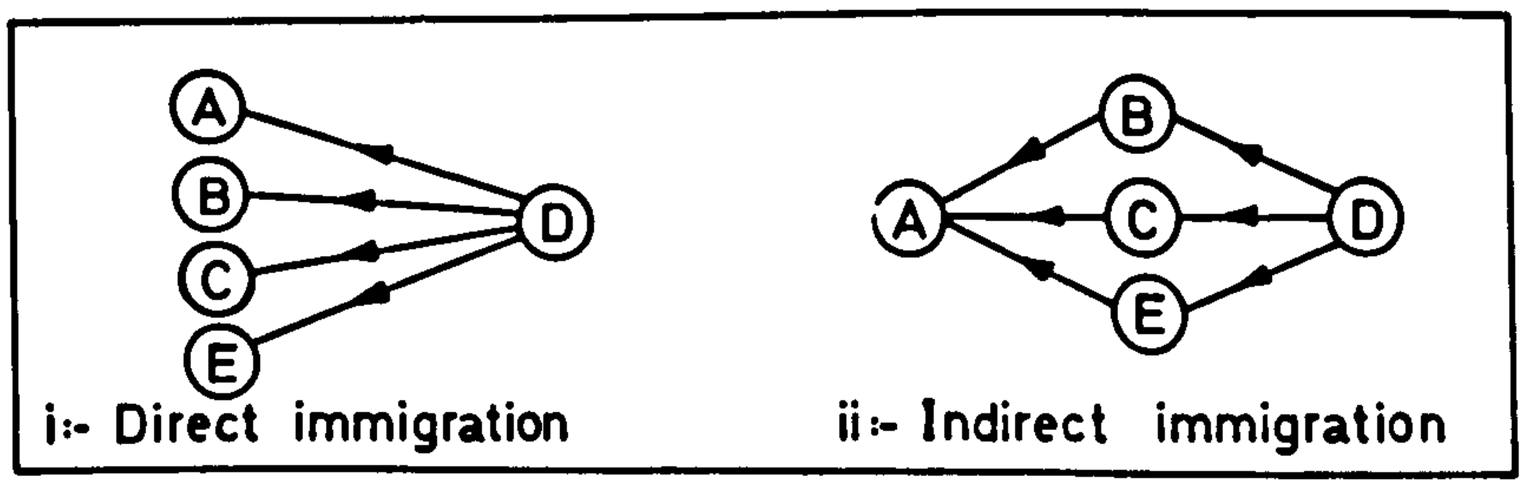


FIG.4.36. System of Najid-region immigrants.

Classification of Immigrants

The classification of the movement of immigrants falls into two categories

(a) Native Inhabitants and Older Generation of Immigrants: parents and children born at both cities and also in the Eastern Province.

(b) Newcomers: those Born Outside the Eastern Province:

The oldest generation of immigrants to Al-Khobar and Dammam was of people born in the Eastern Province, but whose families came from other regions. They moved into the new cities of Al-Khobar and Dammam when these came into existence, ie the period shortly after 1950. The total of these older immigrants at both towns is about 218 persons, making 42.7% of those born at both cities or 6.4% of the total population sample. These were involved in two obvious immigration systems: direct and indirect. The direct system absorbed about 82.1% and the indirect 17.9% of the older immigration.

We may classify the older immigrants by the region of their family origin:

(i) From towns and villages of the Eastern Province (mainly regions B and C). These made up for B about 22.5% and for C 8.7% of the total immigrants, who together account for about 2.0% of the total population sample.

(ii) From Najid, region D, totalling 28.0% of the older immigrants, who accounted for 1.8% of the total population sample.

Of Najid region immigrants to Al-Khobar and Dammam, 36.1% entered on the direct system and 63.9% on the indirect system (see Fig. 4.36, showing an example of the immigration system of Najid people).

(iii) The old-comers from Hijaz, region E, 6.9%; Asir/Southern region F 7.3%; and other regions in Saudi Arabia, G, 4.6%. This class of immigrants were very few in number, and altogether totalled approximately 1.3% of the population sample, through direct immigration to both cities.

(iv) From abroad, category H. These came from neighbouring Arab countries and also other countries, settling down in various Saudi regions and some in Al-Khobar and Dammam, for oil and other businesses. The old immigrants from abroad made up 22.0% of the total old immigrants, and accounted for 1.4% of the total population sample (see Table 4.48, showing the distribution of the old immigrants, by percentage, in both Al-Khobar and Dammam).

TABLE 4.48
DISTRIBUTION OF OLDER IMMIGRANTS ACCORDING TO REGION OF FAMILY ORIGIN

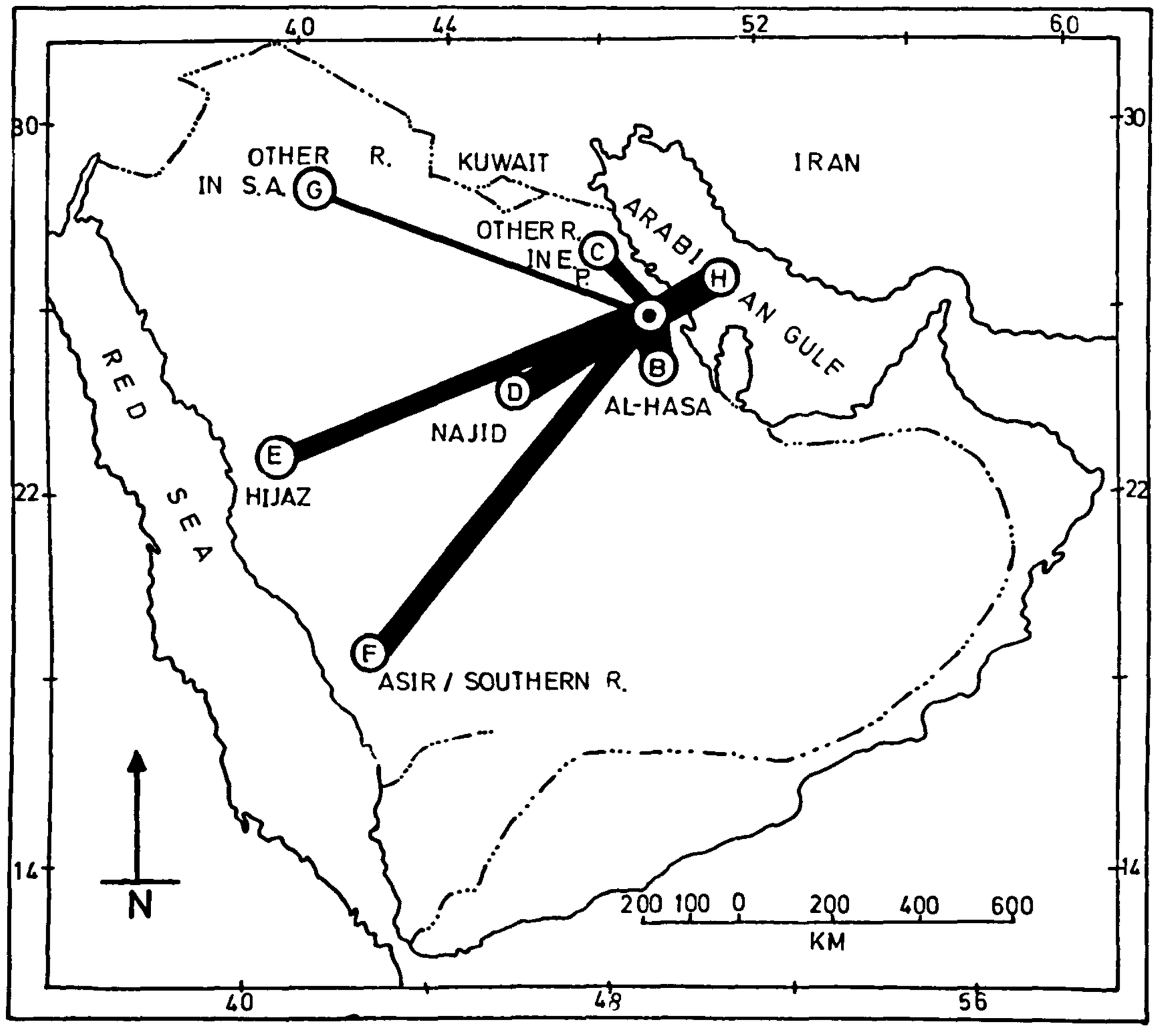
Region of Origin	Older Immigrants		% of Sample	Direct Immigration	Indirect Immigration	Total
	No.	%				
From B towns & villages	49	22.5	1.4	x	-	
From C towns & villages	19	8.7	0.6			
From D Najid	39	17.9	1.1	-	x	
Region	22	10.1	0.6	x	-	
Total of D	61	46.4	1.8			
From Region E (Hijaz)	15	6.9	0.5	x	-	
From Region F (Asir/South)	16	9.2	0.6	x	-	
From Region G (Others)	10	4.6	0.3	x	-	
From abroad	48	22.0	1.4	x	-	
TOTALS	218	100	6.4	82.1%	17.9%	100

Source: Survey (Fieldwork)

The majority of the people from abroad came from Bahrain and Qatar in previous years, totalling about 87.5% of the early immigrants from abroad.

The discovery of oil brought very clear and large economic and social changes. The Eastern Province since the advent of oil has been a target for people seeking work in many different sectors, with varied qualifications, experience and nationality. The newcomers came from other Saudi Regions and abroad (See Fig 4 .37).

FIG. 4.37 IMMIGRANTS TO DAMMAM & AL-KHOBAR.



Other Saudi Arabian Regions

The movement of people within Saudi Arabia was very active after the discovery of oil, but the main activity took place after 1950, and also increased later due to the economic development which took place during the 1960's over the whole of Saudi Arabia. It is obvious that the new arrivals brought with them different levels of education, qualifications and experiences, and injected new blood into the population of the two towns. (See Table 4.49).

Equally important is the fact that immigrants enter the Eastern Province to meet certain labour demands, demands which vary in the requirements made on immigrants' qualifications. Thus a construction boom attracts unskilled, uneducated workers to a greater degree than does expansion in education. Since of the very small amount of data on the incomers which is obtainable is that on education, this can be used to explain, in part at least, why certain countries and regions of origin of immigrants are proportionately important.

As seen in Table 4.50 the movement into both towns varied directly with the distance between them and the region of origin; where the distance was greatest movement was less and vice-versa. The distance between the two towns and Al-Hasa is only about 159 kilometres and the percentage of newcomers from the latter was high, 33.2% of the internal total; for regions further away the percentage of immigrants gradually decreased to 3.0% where the distance was more than 1,200 kilometres.

The Education of Immigrants from other Saudi Regions

The newcomers from other Saudi regions have varying levels of education. In general, those educated up to elementary and intermediate level made up the greatest number, elementary being 23.6% and intermediate 24.3% Graduates totalled only 4.1% of the internal total. The highest percentage of graduates came from the region of Hijaz - about 7.6% of the total graduate intake. The trades people with some experience in specific trades accounted for 7.7% and the lower percentage (about 12.2%) coming from Al-Hasa region.

Immigrants from Abroad

Most of the people from abroad who are settled at Al-Khobar and Dammam

TABLE 4.49

REGIONAL ORIGIN OF INTERNAL NEWCOMERS TO AL-KHOBAR AND DAMMAM AND EDUCATIONAL QUALIFICATIONS (PERCENTAGES)

Region	Newcomers		Elementary	Intermediate	Secondary	Graduate	Tread	Reading & Writing	Illiterate	Unknown	Total
	No.	%									
Al-Hasa	713	33.2	21.3	23.7	9.1	1.3	12.2	19.4	8.0	5.0	100
Other regions in Eastern Province	259	12.1	26.3	26.6	7.2	4.2	5.8	22.4	6.6	0.8	100
Najid	528	24.6	24.1	22.3	15.9	5.5	6.3	17.6	3.8	4.5	100
Hijaz	290	13.5	20.0	25.9	19.3	7.6	5.9	17.9	3.4	-	100
Asir/South	291	13.6	26.8	23.4	19.2	6.2	4.8	14.1	5.5	-	100
Other regions in Saudi Arabia	65	3.0	36.9	35.4	15.4	-	-	9.2	-	3.1	100
TOTALS	2146	100	23.6	24.3	13.5	4.1	7.7	18.1	5.6	3.0	100

Source: Survey (Fieldwork)

came from about twenty countries as follows:

(a) 25.9% from six Arabian Gulf countries

(b) 69.2% from nine other Arab countries

(c) 4.9% from non-Arab countries (see Table 4.50 showing distribution of people from abroad, divided into the three categories.)

TABLE 4.50

DISTRIBUTION OF NEWCOMERS FROM ABROAD

Element	Number	Percentage
Gulf countries	163	25.9
Other Arab countries	435	69.2
Non-Arab countries	31	4.9
Totals	629	100

Source: Survey (Fieldwork)

Arabian Gulf Countries

For the social relationship between the Eastern Province and the Arabian Gulf countries, there were many people living in Al-Khobar and Dammam who came from Bahrain, Kuwait, Qatar, Dubai, Oman and Buraimi. The percentage of each shows that the highest number of immigrants came from Bahrain (60.1%), and Buraimi was the lowest (3.7%). (See Table 4.51 for the distribution of immigrants from the Arabian Gulf countries giving their educational level by percentage).

The Education of the Arabian Gulf Immigrants

The educational levels of these people were 28.8% at the elementary level and 20.9% with merely a knowledge of reading and writing. The other levels were lower, and none of them were graduates. The assumption must be that in the past the size of the Saudi Arabian demand for labour is even greater than in the Emirates and secondly that some of the incomes only used the Emirates as staging-posts in a longer journey from elsewhere e.g. Oman and Yemen.

Other Arab Countries

The immigrants to Al-Khobar and Dammam came from nine other Arab countries - North Yemen and South Yemen (Southern Arabia), Iraq, Palestine, Jordan, Syria and Lebanon (from the fertile crescent area), Egypt and the

TABLE 4.5.1

NATIONAL ORIGIN AND EDUCATIONAL QUALIFICATIONS OF IMMIGRANTS FROM ARABIAN GULF COUNTRIES (PERCENTAGES)

Element	Immigrants		Elementary	Intermediate	Secondary	Tread	Reading & Writing	Illiterate	Total
	No.	%							
Bahrain	98	60.1	19.4	15.3	15.3	15.3	18.4	16.3	100
Kuwait	19	11.7	42.1	26.3	15.8	-	15.8	-	100
Qatar	15	9.2	33.3	20.0	13.3	1	20.0	13.5	100
Dubai	10	6.1	30.0	20.0	10.0	-	10.0	30.0	100
Oman	15	9.2	66.7	-	-	-	33.3	-	100
Buraimi	6	3.7	33.3	-	-	-	66.7	-	100
TOTALS	163	100	28.8	15.3	12.9	9.2	20.9	12.9	100

Source: Survey (Fieldwork)

TABLE 4.5.2

NATIONAL ORIGIN AND EDUCATIONAL QUALIFICATIONS OF IMMIGRANTS FROM OTHER ARAB COUNTRIES (PERCENTAGE)

Origin	Immigrants		Elementary	Intermediate	Secondary	Graduate	Reading & Writing	Illiterate	Unknown	Total
	No.	%								
North Yemen	59	13.6	25.4	8.5	8.5	-	30.5	27.1	-	100
South Yemen	83	19.1	24.1	21.7	-	-	36.1	-	18.1	100
Iraq	47	10.8	38.3	40.4	6.4	10.6	-	-	4.3	100
Palestine	84	19.3	9.5	23.8	31.0	35.7	-	-	-	100
Jordan	35	8.0	-	-	17.1	62.9	20.0	-	-	100
Syria	16	3.7	62.5	-	37.5	-	-	-	-	100
Lebanon	10	2.3	-	50.0	50.0	-	-	-	-	100
Egypt	90	20.7	5.6	38.9	16.7	27.8	11.1	-	-	100
Sudan	11	2.5	-	-	-	100	-	-	-	100
TOTALS	435	100	17.5	23.4	15.2	21.4	14.9	3.7	3.9	100

Source: Survey (Fieldwork)

Sudan (from north-east Africa). (See Table 4.52 showing the distribution by percentage of Arab countries and their levels of education). The highest percentage came from South Yemen, Palestine and Egypt, and the second highest were from North Yemen.

The Education of Immigrants from Other Arab Countries

From the other Arab countries the largest group was educated to intermediate level (23.4%), the second to graduate level (21.4%); the other levels were distributed between elementary (17.5%) and those who could only read and write (14.9%); the remainder (approximately 27.1%) being illiterate.

The great variety of business and economic activities which was growing up attracted those seeking work to come to Al-Khobar and Dammam where the ever-increasing range of businesses required many different levels of education, and which many immigrants from abroad already possessed. In these circumstances there were relatively many jobs in different sectors. Yemeni people almost all go to work in the construction industry, as unskilled labourers (ummal); the Hadarim people from South Yemen go to the commercial sectors and the others go to various other occupations.

Non-Arab Countries

The growth rate of economic activities in Saudi Arabia, in particular at the two towns of Al-Khobar and Dammam,attracted many non-Arabs to come and work in the various companies, with the exception of Aramco employees, who almost all live privately at Dhahran and other oil towns.

Table 4.53 shows that the highest number of non-Arab immigrants (35.5%) are settlers from Pakistan and the next largest are British, who account for 19.4%. American immigrants who are not employed by Aramco work with other companies and live in Al-Khobar and make up 12.9%

The Education of Non-Arab People

These were mostly educated to graduate level. Many Pakistanis were educated to graduate level as were almost all British and Americans. Those with higher degrees were only found amongst the British and Americans. The remainder are educated to elementary and intermediate levels (See Table 4.53).

TABLE 4.53

NATIONAL ORIGIN AND EDUCATIONAL QUALIFICATIONS OF NON-ARAB IMMIGRANTS (PERCENTAGE)

Origin	Immigrant		Elementary	Intermediate	Secondary	Graduate	Higher Degree	Total
	No.	%						
Somalia	5	16.1	40.0	60.0	-	-	-	100
Pakistan	11	35.5	-	45.5	36.4	18.2	-	100
Kashgar*	5	16.1	40.0	60.0	-	-	-	100
Britain	6	19.4	-	-	-	66.7	33.3	100
USA	4	12.9	-	-	-	75.0	25.0	100
TOTALS	31	100	12.9	35.5	12.9	29.0	9.7	100

* Kashgar - in the west of Sinkiang, in the east of Asia, near the south-east of Kirghiz, USSR boundaries

Source: Survey (Fieldwork)

There are many exceptional features in the overall characteristics of the people from abroad, which are derived from specific legal requirements:

(a) the policy of residence permits which allows them to work in any type of work, particularly for the Arab people.

(b) The new foreign policy of 1971, which stated that there are exceptions for:

(i) people from Hadramut and Yemen, who receive a residence permit for two years, with an option to renew this permit when it expires;

(ii) business people who normally have a contract for a residence permit of not less than two years;

(iii) foreign students who require a residence permit of not less than four years duration.

These residence permits can be renewed many times depending on business requirements, and some of those people who settle down for many years eventually obtain Saudi nationality.

Each year Al-Khobar and Dammam admit a thousand people with short or long-term residence permits from abroad (See Table 4.54) showing the total numbers of residence permits issued for the five years from 1968-72; it also shows the annual increase in immigrants; the proportion issued with one-year minimum residence permits - this gradually rises between 1968 and 1970, with the highest increase being from 1970-71, then falling in 1972). (See also Table 4.55 showing the increase in percentages).

The greatest majority of the newcomers of different nationalities arriving at both cities were first of all from Yemen; they arrived in large numbers every year (See Table 4.56 showing the increase in different nationalities for the years 1970-72).

TABLE 4.54.
RESIDENCE PERMITS ISSUED TO IMMIGRANTS OF DIFFERENT NATIONALITIES
(AL-KHOBAR AND DAMMAM)

1968			1969			1970			1971			1972		
No.	Permanent	%	No.	Permanent	%	No.	Permanent	%	No.	Permanent	%	No.	Permanent	%
27682	10553	61.9	28028	18736	66.8	29376	24197	82.4	39329	36072	91.7	40952	40219	98.2

Source: Unpublished Immigration Statistics.

TABLE 4.55
ANNUAL INCREASE IN PERCENTAGE OF FOREIGN ARRIVALS

Year	Increase in Percentage
1968-69	1.2
1968-70	4.6
1970-71	25.3
1971-72	4.0

Source: Survey Unpublished Immigration Statistics.

TABLE 4.56
SELECTED NATIONAL GROUPS OF NEWCOMERS FRO THE THREE YEARS 1970-72 (PERCENTAGE OF ALL FOREIGN BORN)

Nationality	1970	1971	1972
Yemeni	28.2	44.0	59.2
USA	9.5	8.0	5.9
British	4.1	3.7	5.5
European	2.0	1.6	1.7
Pakistani	7.7	7.7	5.1
Indian	4.5	3.5	2.4
TOTALS	56.0	68.5	79.8

Source: Survey Unpublished Immigration Statistics

CONCLUSION

Since no general demographic information is available for the Eastern Province as a whole since 1962/63 and the survey data collected by the author and other estimates have only partial coverage, the detailed conclusions which can be arrived at are bound to be limited. The main points which can be made are as follows.

First, the general rate of population growth as a total for all those settlements for which information and data are available has increased, and particularly since 1970. The only towns which have had a decrease in population are the three oil towns, Dhahran, Ras Tannura and Abqaiq (see Chapter 8, p.359). These were the settlements in which Aramco employees were predominant and most numerous during the oil field first exploitation phase and the first phase of refinery establishment. When these employees were no longer required for oil company work, the expatriates in particular, left. However the other urban settlements continued to grow as their range of functions and general urban activities increased; this was as true of the old oasis settlement of Hofuf as of the new town of Dammam.

Secondly, a great part of this population growth resulted from immigration into the Eastern Province from other parts of Saudi Arabia as well as from abroad (see pp.109-128). The characteristics of this immigrant population can only be examined in detail by using the author's own survey data, limited to Dammam and Al-Khobar, in the absence of census material, but the other data given earlier in this chapter, and the facts of the physical expansion noted in Chapter 8 allow some generalisations to be made. The main area of attraction to immigrants was the Midland region - Dhahran, Al-Khobar, Dammam. These new towns were also where the facilities and services which normally produce any growth of the rate of natural increase - public health services such as hospitals and clinics, improved water supply etc., were established most quickly. There are no vital statistics available but we would expect rising natural increase in population to

parallel the rising rate of immigration in these towns.

The immigrants themselves came either with relatively high educational and technical qualifications to work in the new technology of the oil and other industries and also in some of the public services, or come essentially as labourers or unskilled workers during a period of growing labour shortage in the Eastern Province. The skilled American expatriates were settled almost entirely in the oil company town, Dhahran, whose location had been fixed by the proximity to the first oil strike of a reasonable site for Aramco headquarters (see Chapter 8). Many other skilled expatriate immigrants were employed by firms and businesses which were established to take advantage of oil company and government needs, for example, engineering contractors. European employees unable to live in Dhahran tended to concentrate in the next nearest town, Al-Khobar, and in the northern part of it.

As can be seen from Tables 4.49, 4.51, 4.52 and 4.53, the different origin groups of immigrants brought with them different qualifications and capabilities and these mainly determined the location of their residences. Saudi Arabians mainly own and control the wholesale and retail trade in foodstuffs and it is the commercial attractiveness in this way of the various towns which determined their location. Larger scale businesses, e.g. contractors and engineering companies, have mixed ownership and control by Saudi citizens, Saudi companies and Saudi government agencies and foreign companies. As a result, at the managerial and technological level there is a predominance of European expatriates with some Saudis, the latter mainly living in Dammam.

The need for literacy and training for work at middle level in hospitals, schools, banks and public and private offices has resulted in the large-scale employment of educated Arab immigrants, particularly from Egypt, Jordan and Palestine. Dammam and to some extent Al-Khobar attracted these expatriates, although the effect of foreign company employees living - often at company expense - in Al-Khobar is reported to make that town more expensive than Dammam and therefore less attractive to other immigrants.

From the questionnaire survey section on employment we can make some other tentative generalisations. The most unskilled groups of immigrants, from North Yemen, are employed in the least technologically demanding services, e.g. coffee houses, laundries, tailors, as retail assistants in food shops and in carpentry, brick and concrete workshops. Immigrants from South Yemen, the Hadarim, are also found in the shops, particularly clothing and household goods, as well as in money changers, banks and shops handling vehicle parts. The Palestinian and Sudanese immigrants are employed heavily in the better hotels and restaurants. Indians and Pakistanis are particularly important as tailors and hairdressers. Yemenis provide the majority of unskilled and semi-skilled labourers in the construction industry, being supervised by qualified Arab immigrants.

The town with the greatest range of immigrants by origin is the one with the greatest range of economic activity - Dammam, and the smallest immigrant range is in the most specialised town, Dhahran. This is to some extent also reflected in urban architecture, as pointed out in Chapter 8. Dhahran has been designed on American small-town lines for American senior staff, northern Al-Khobar has an area of housing designed for European styles, while in Dammam there is a mixture of all designs, old and new.

There is also the influence on the towns of the different purposes for which the immigrants have come. The Europeans and Americans are almost always in the Eastern Province for fixed contract periods and have no intention of permanent settlement. They are usually senior staff with high incomes, high expenditures, living in rented accommodation with a large floor area per person. A varying proportion of these have their families with them, but no statistics are available except for Aramco employees (see Table 8.73, p. 359). At the other extreme, it is extremely rare for Yemeni immigrants to bring their families with them; they, like most other unskilled labourers, are mainly concerned with saving the maximum part of their relatively low incomes for returning home. As a

result, their expenditure level within the towns is extremely low and they are prepared to have extremely congested living accommodation.

As a result of the recent relaxation of Saudi Arabian regulations governing the renewal of work permits, although not of the granting of citizenship, other Moslem expatriate immigrants stay in the Eastern Province for indefinite periods for as long as they and their employers wish, but apart from the Palestinians few of them have so far tried to establish themselves permanently. For this reason, many relatively skilled members of this group do not have their families with them.

The most permanent part of the immigrant population is that which comes from other regions of Saudi Arabia. As noted on p. 119 the majority of these people come to Dammam and Al-Khobar from other parts of the Eastern Province and from Najid. This group of immigrants generally includes whole families, and this appears in the age-structure contrasts between Saudi and expatriate immigrants to the new towns (see Figs. 4.18 to 4.30, contrasted with 4.32).

The Child/Adult ratio, shown for the sampled population of Al-Khobar and Dammam, might be expected to reflect the different age structures of the various immigrant populations. Unfortunately, child/adult ratios are difficult to compare for different countries, either because censuses have different groupings of ages, because censuses do not contain age-structure detail or because where census or survey material is available (as in the UK or USA) other economic and social differences become acute. For example there is insufficient data to work out child/adult ratio for migrants as distinguished from others for Libya while a study of migrants in Iran has been described as "statistically suspect".[22]

One study made of Tanzania[23] does allow some standard of comparison. Here it has been pointed out that "this ratio tends to be comparatively high for the non-migrant category and low for all the others." The Tanzanian child/adult ratio for the number of children aged 0 to 4 per adult is 15-44 (different age-groupings than in Saudi Arabia), compared with

that for Dammam and Al-Khobar (children 0-5 per adult 25-40) as follows:

	Born in same location:		Born in other countries:	
Tanzania:	m.	f.	m.	f.
Mainland Urban	0.96	0.89	0.08	0.10
Zanzibar	1.00	1.00	0.03	0.06

Saudi Arabia:	All Populations:	
	m.	f.
Al Khobar	0.79	0.92
Dammam	0.72	0.67

This comparison, indicating that the child/adult ratio in the sampled population of the two Eastern Province towns is much closer to that found in the locally born Tanzanian populations than to the immigrant Tanzanian populations, raises other questions. The age-structure of the foreign born population in the Eastern Province shows a very low proportion of children compared with adults, similar to that of Tanzanian immigrants. If therefore the child/adult ratio average in Dammam and Al-Khobar is to be brought up to the sample figures, then the child/adult ratio of the Saudi Arabian population must be extremely high. All the other evidence supports the existence of a very low child/adult ratio among immigrants and therefore the age-structures shown for the Saudi Arabian population in Figs. 4.19 and 4.31 are generally corroborated. It may even be true that the sample under-reports the number of children. In the absence of more detailed data this cannot be analysed further but the growth by natural increase of these towns can be expected to be very rapid, even explosive.

The consequences now and in the future of the trends which are indicated by these facts are very considerable for urban settlement and development. The government is trying to establish as quickly as possible the social facilities to meet the demands of the increasing population. In the past, before 1950, most of the population were responsible for their own medical-care, education and other services, and the availability of these was very limited particularly for the lower income population at that time.

The result is that the majority of the indigenous population aged 40 or over today received virtually no formal education when young, neither did they benefit when young from modern medical facilities. The immigrant population, depending on the region of origin, arrived with different educational and health backgrounds (see p.123-125). The supply of social and health facilities had to be undertaken at the same time that the very rapid urban expansion was under way. The scale of total demand became more important than the nature of the relationship between age-structure, health, educational background etc. and particular groups within the expanding population. The only policy could be to build as fast as possible the schools, hospitals, health centres as well as the water and electricity supply systems and detailed locational factors within the urban settlements had to be virtually ignored. At the same time, the sequence of rapid building has meant that even the government schools and hospitals which are officially of the same grade are, in fact, very varied in age, facilities and in reputation.

A preliminary investigation of the spatial relationships between schools and the residential quarters showed that no deliberate planning of location has been undertaken and that it was impossible to make any "catchment area" studies. When children reach various schooling levels they are alloted places at particular schools, with no reference to their place of residence, but only to the number of places available at particular schools. Secondly, those parents who are able to do so frequently get their children transferred to those schools which are regarded as superior or sometimes near a father's workplace in order to make transport easier. Since the schools themselves were located mainly on the basis of land availability the result is one in which no planned spatial order or network is visible. Children go to school where they can, and that is all. With the rapid increase in the school age population and the new powers given to the municipalities, some locational planning is now desirable and possible.

The health services similarly have grown in a period of changing

population structure as well as changing social demand. The total demand for hospital, out patient and clinic services has been very great and has mainly been met in the main towns. The urban population expansion has therefore received most attention in this field, and the non-urban population, although increasingly served by clinics, believes that it has been relatively neglected. The special needs which go along with an increasing proportion of dependents - children and old people - in the population, cannot as yet bet met. Here again, site location has been governed mainly by land availability within the towns.

These are two examples of a situation in which, up to the early 1970's, changing demographic patterns and migration were transforming the Eastern Province and in which the volume and speed of urban population growth dominated all considerations. From 1970 onwards, and with the information obtained for the unpublished 1975 Census, it will become important and possible to identify special needs resulting from particular aspects of population trends and also to introduce locational policy for the first time into the planning of the provision of social, health and other facilities. The 5th Year Plan published in 1975 indicates that this is now a future possibility, but this cannot be discussed here.

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CHAPTER FIVE

THE SOCIAL SERVICES

In the survey of population, numbers, structure and trends, as well as in the sample study of immigration, two points relevant to the social services emerge as relevant to this thesis. The first is that demographic trends are strongly influenced by the availability of social services, the provision of which is made possible by oil-wealth which also affects all other sectors. The second is that the spatial distribution of social services and sub-regional trends in their provision is to some degree an indicator of the economic and social status of different settlements and of their growth trends. With this in mind, a short survey is made here of the main social services.

A. Education

A modern education system has been expanded to cover large and small communities in the Eastern Province since the discovery of oil. The old traditional system of education, which only concentrated on teaching the Koran, Islamic traditions and the ability to read and write up to the elementary stage is fast being replaced. Today's educational system provides several levels of schools, teaching various subjects up to the higher education level, for both boys and girls.

Schools are established in each city, town or village and attendance is compulsory for boys and girls from 6-7 years of age. Education is divided into five stages; children attend the kindergarten up to the age of 6-7, and then transfer to elementary school. This is followed by a three-year intermediate course, a three-year secondary course, and then by higher education at a university or college.

1. Education System

Four administrative councils are responsible for education in the province. Their functions are set out below:

(a) The ministry of Education administers boys schools at all levels from kindergarten to secondary, from two District Education Offices in Dammam and Hofuf.

(b) The General Presidency of Girls' Education administers girls schools at all levels from its two offices in Dammam and Hofuf. This Council is controlled by the religious authorities, and has full co-operation in all technical matters from the Ministry of Education.[1]

(c) The Ministry of Petroleum and Mineral Resources is responsible for the Petroleum University in Dhahran.

(d) Aramco Oil Company, which is responsible for its own schools in its communities in Dhahran, Abquaiq and R as Tannura; these schools almost invariably follow American educational programmes in preference to the Saudi system.[2]

In addition there are many private schools for boys and girls below elementary level, and for girls only at the elementary, intermediate and secondary levels. These schools are under the supervision of both the Ministry of Education and the Presidency of Girls Education.

2. Growth of Education

Under the old educational system prior to the recent development of the Eastern Province, few people received any form of education. In 1936 the new educational system was introduced in Hofuf with the opening of a new elementary school for 160 boys. By 1946, only ten years later, there were 13 schools with a total of 454 boys, an average rate of increase of 1.3 schools per annum[3] and new schools were being opened in every town and village of the Eastern Province.

The most noticeable developments came after 1960 when education became available for everyone, male and female. The education of girls began officially in 1960 with the opening of 3 elementary schools for girls in Dammam, Al-Khobar and Hofuf, with places for 1059 girls. Higher education was first introduced in Dhahran with the building of the Petroleum College in 1963. This college opened officially in 1965 with 67 students. The Marine College was later built on the road between Dammam and Al-Khobar. In addition the education of adults was introduced

in 1964-65, with 73 schools all over the province, of which they are the day schools, catering for 6827 adult students at elementary level. Since 1960 the programme of 'education for all' has grown rapidly, with about 29 schools being opened each year. (See Table 5.1 showing the growth of schools in the Eastern Province, 1964-73)

TABLE 5.1

GROWTH OF SCHOOLS IN THE EASTERN PROVINCE 1964-73

Academic Year	Girls' Schools		Boys' Schools		Adult Schools		Petroleum University Students
	Schools	Pupils	Schools	Pupils	Schools	Pupils	
1964-5	30	7874	143	36052	73	6827	67
1965-6	39	10178	163	40323	81	7456	103
1966-7	48	13477	177	43768	93	8231	142
1967-8	54	16591	175	51100	96	7367	153
1968-9	60	19346	221	55827	95	6844	279
1969-70	80	25174	238	58734	90	8220	450
1970-1	92	29953	248	62832	95	8637	506
1971-2	121	35002	271	69015	97	8631	723
1972-3	133	38885	299	72019	109	9938	894

Source: Ministry of Education
General Presidency of Girls Education
Ministry of Finance, Central Department of Statistics

In January 1975 facilities for higher education in the Eastern Province were developed even further, with the programme which developed and exapnded the Petroleum College into the University of Petroleum. This University has faculties of science, arts, engineering, applied engineering, industry and administration, a college of higher studies, and also runs the applied geological centre in Jeddah in the Western Province.[4] Plans for medical and engineering colleges are under study and these are expected to open in 1976.

3. Distribution of Schools

According to the Ministry of Education and the General Presidency, statistics for the academic year 1972-73 were as follows: the number of students (girls and boys) at all levels totalled 120,842, or about 26.2% of the total population of the Eastern Province in 1973.

Approximately 32.6% were girls, 59.6% were boys and 8.2% were adults of both sexes. These figures do not include students at the Petroleum University and at Aramco private schools. Schools in the province were divided as follows: girls schools 24.6%; boys schools 55.3% and schools for adult education 20.1%.

About 62.5% of all schools are concentrated in the northern area of the Eastern Province (Dammam, Al-Khobar, Dhahran, Qatif Oasis and the surrounding areas), the remaining 37.5% being in Al-Hasa Oasis. The highest proportion were located in Dammam 1 about 23.2% (See Table 5.2 showing distribution of schools, excluding adult education centres, in the Eastern Province.

TABLE 5.2

DISTRIBUTION OF SCHOOLS IN THE EASTERN PROVINCE (1972-3)

Levels	Northern Area		Al-Hasa Oasis		Totals
	Girls	Boys	Girls	Boys	
Kindergarten	*	11*	*	1	12
Elementary	59	119	40	85	303
Intermediate	15	49	5	22	87
Secondary	4	8	1	2	15
Teacher Training	6	1	2	1	10
Industrial	-	-	-	1	1
Commercial	-	1	-	-	1
Special	-	1	1	-	2
Girls Nursing School	-	-	1	-	1
TOTALS	84	186	49	112	432

* Mixed in kindergarten level, boys and girls

Source: Ministry of Education
General Presidence of Girls Education

The significance of these educational developments to this study of settlements if two-fold. First, the impact of oil on the Eastern Province is shown to be not only of direct economic importance but also as having general social and cultural effects which indirectly are also of economic importance. The oil revenue which made possible a vast scale of expenditure on education also opened the eyes of a population

suddenly confronted with new opportunities to the need for education in order to be able to sieze these opportunities. The rural-urban contrast in opportunities and in educational facilities was obviously increased along with other differentials and the attractiveness of the old and particularly the new urban settlements was strengthened. One particular revolutionary aspect of this is seen in the educational provision made for girls, this especially large in the main towns.

Secondly, the spatial differences in the urban hierarchy as well as the functional characteristics of each of the different settlements is emphasised as much in this field of social provision as in industry and commerce. Hofuf, the traditionally most important settlement, is where educational facilities were first expanded but it was soon overtaken by developments in the newer though smaller towns. Dhahran, even in education, appears as the centre of the oil industry; here it is that the first higher educational establishment was built on a technological base. Dammam, which replaced Hofuf as the administrative capital and became the main industrial and commercial centre also develops most complete general educational facilities. In all this, Hofuf and Al-Hasa may be seen to become less central and relatively less significant in the new-type Eastern Province which has developed since 1946 and which is still developing. (See further Chapter 8.F and Chapter 9)

B. Health Services

Prior to 1940 health facilities and vaccination programmes were rare in the Eastern Province, and diseases such as trachoma and malaria were common, particularly in Qatif Oasis. Early in the 1950s the government and the oil company (Aramco) medical staff co-operated in a fight against malaria and this disease, common in the province for centuries, is now rare. A similar programme was organised in 1954 for research into trachoma, a highly infectious eye disease.

The Saudi Ministry of Health, the World Health Organisation,(WHO) and Aramco have together brought about great improvements to health services in the Eastern Province, and have considerably reduced the incidence of these diseases. The plan uses Dammam hospital as a main base hospital, with satellite community health centres in Safwa. and Qatif.[5] Great improvements have been made in the available health services, and free medical care is now available throughout the province.

1. Medical Facilities

Three medical organisations operate medical services in the Eastern Province. These are:

(a) The government services, provided by the Ministry of Health.

(b) The oil company (Aramco) services.

(c) The private services.

These organisations are responsible for all medical services in the Province. in 1972 the number of hospitals in the Eastern Province was 13, 19.7% of the total number of hospitals in Saudi Arabia. 42 dispensaries, 19 health centres and 76 wholesale and retail drugstores, in addition to the pharmacy department within every hospital, were spread through the entire province.

2. Availability and Distribution of Health Services

The hospitals are situated in the major cities and towns; in Dammam there are two government hospitals, the Central and the Chest Hospital; in Al-Khobar there are five hospitals, four private and one government-sponsored. The government hospital and three private hospitals are general hospitals, and the remaining private hospital specialises in eye diseases. Hofuf has two hospitals, both general; one is private and the other government sponsored. Aramco has a general hospital and health centre in both Dhahran and Ras Tannura. Both Qatif and Al-Jubail have government run hospitals.

Out-patient treatments and emergency operations are carried out in government owned dispensaries in towns, cities and villages throughout the province. The health centres are normally found in rural areas, but

are also in Dammam, Al-Khobar, Hofuf and Quatif, mainly supplying health facilities for schools. Health centres are usually one-room clinics, supplying first-aid and treatment of minor ailments.

3. Outpatient Problems

Under the present system no medical records are kept for individual patients in Saudi Arabia, and there are no 'family doctors' as such. Patients can visit the outpatients department of any hospital or dispensary owned by the government at any time, and these hospital departments handle about 50 patients a day. In 1967 the number of patients visiting the out-patient departments of government hospitals and dispensaries was 1,590,846; by 1972 this figure had risen to 2,226,398 an increase of 40% over the 1967 figure, and 30.7% higher than that for 1971. In the absence of family doctor practice, the hospitals and dispensaries - the former wholly and the latter mainly - located in the larger town become special focuses of attraction. Within the towns, the location of these centralised medical services, as with the schools, has been largely a matter of establishing them on those open sites available at the time and in the built up area. There has been no zoning or location policy as such. In spite of the building-up of a network of clinics and dispensaires in smaller settlements throughout the region, the main towns are still the centre of medical care to which people must travel.

The general points made about the relationship between educational facilities and the urban centres are clearly also valid for health services. The confirmation of the appearance of a 'Golden Triangle' of urban settlements - Dammam, Dhahran, Al-Khobar - is striking even though the absence of more detailed data other than that quoted makes it impossible to take this further.

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1 A. Abdul-Wassia (1970) Education in Saudi Arabia p.36

2 Personal letters

3 A.A. Niaim (1970) The Eastern Province between the Past and the Present p.97 (in Arabic)

4 Kafilat Al-Zait, February-March 1975, p.18

5 Aramco (1968) Aramco Handbook pp.167-168

CHAPTER SIX

INDUSTRY

So far we have examined the eastern province as a whole in terms of the physical environment, the traditional and primary economic activities of agriculture and fishing, of the population, and looked at immigration and its effects on population make-up through sample studies. Immigration, as already noted, has been a response to recent changes in the economic basis of life in the Eastern province, changes which are associated with the exploitation of oil resources and also with other aspects of industrialisation. Before turning to the sample studies of settlements we will first survey the industrial scene (including public utilities).

A. Oil Sector

The Oil Industry and its Growth

1. The development of oil in the Eastern Province

(a) Oil discovery

Oil was first produced in commercial quantities in 1938 from well No. 7 (depth 4727 feet) at Dammam Dome near Dhahran. This proved to be an important oil field, and the construction and development plans which had been prepared were immediately put into operation. From that date Saudi Arabia as a whole has been transformed from being a land of limited resources to the richest country in Arabia. The discovery of well No. 7 was followed by the drilling of other wells in the Eastern Province. The outbreak of war in 1939 brought many difficulties against further investigation, as Dhahran itself (the headquarters of the oil company) was slightly damaged by Italian planes in October 1940 and many employees left Dhahran for their homes during the war. Even more important was the pre-occupation of western oil companies and governments with World War II. In spite of the war, further investigations were carried on by the remaining employees.

By the end of 1945 three further fields had been discovered and by 1972 the oil concession areas and the located oil fields of proven commercial value were as shown in Fig. 6.1 and 6.2. The sequence of field discovery is shown in Table 6.1 and the growth of oil and gas production and export are shown in Table 6.2 and Figs. 6.3 to 6.6.

(b) Crude Oil Production

The production of crude oil has shown an average annual increase from 1940 to 1950 of about 53.4%; from 1951 to 1961 about 9.3% and from 1962 to 1972 about 14.0%. (See Table 6.2 showing daily and annual oil production from 1938 to 1972). This rate of increase of course was not constant. During the second world war production fell to its lowest in the years 1941-43. In 1944 production jumped 60.1% from 1943, but after this production increases were associated with the rate of discovery of more fields, and from 1955 to 1958 increases were moderate compared with most of the postwar years. The closing of the Suez Canal during the years of 1956 and 1957 adversely affected the oil industry, but in 1959 production increased 7.9% more than in 1958, and then the increases began to climb steadily through 1964, rising sharply to 1972. (See Fig. 6.3 showing the oil production growth).

(c) Gas Production

Practically all the gas produced in Saudi Arabia is associated with the production of oil, and it is the greatest competitor of crude oil. By the end of 1958 gas production rose above 700 million standard cubic feet per day, of which about 57.1% of the total was used for injection into the structure,[1] the remainder being used in other ways by the company, consumed locally or flared off. By the end of 1965 gas production had risen to 1250 million standard cubic feet per day. About 36.8% of the total was consumed by Aramco and locally, and the rest was burned out.[2] (See Fig. 6.4 production of natural gas in the Eastern Province).

In June 1968 an agreement was signed providing for the supply of liquified petroleum gas (LPG) by Aramco to Petromin, which in turn

FIG. 6.1 PETROLEUM CONCESSION AREAS IN SAUDI ARABIA (1933-72)

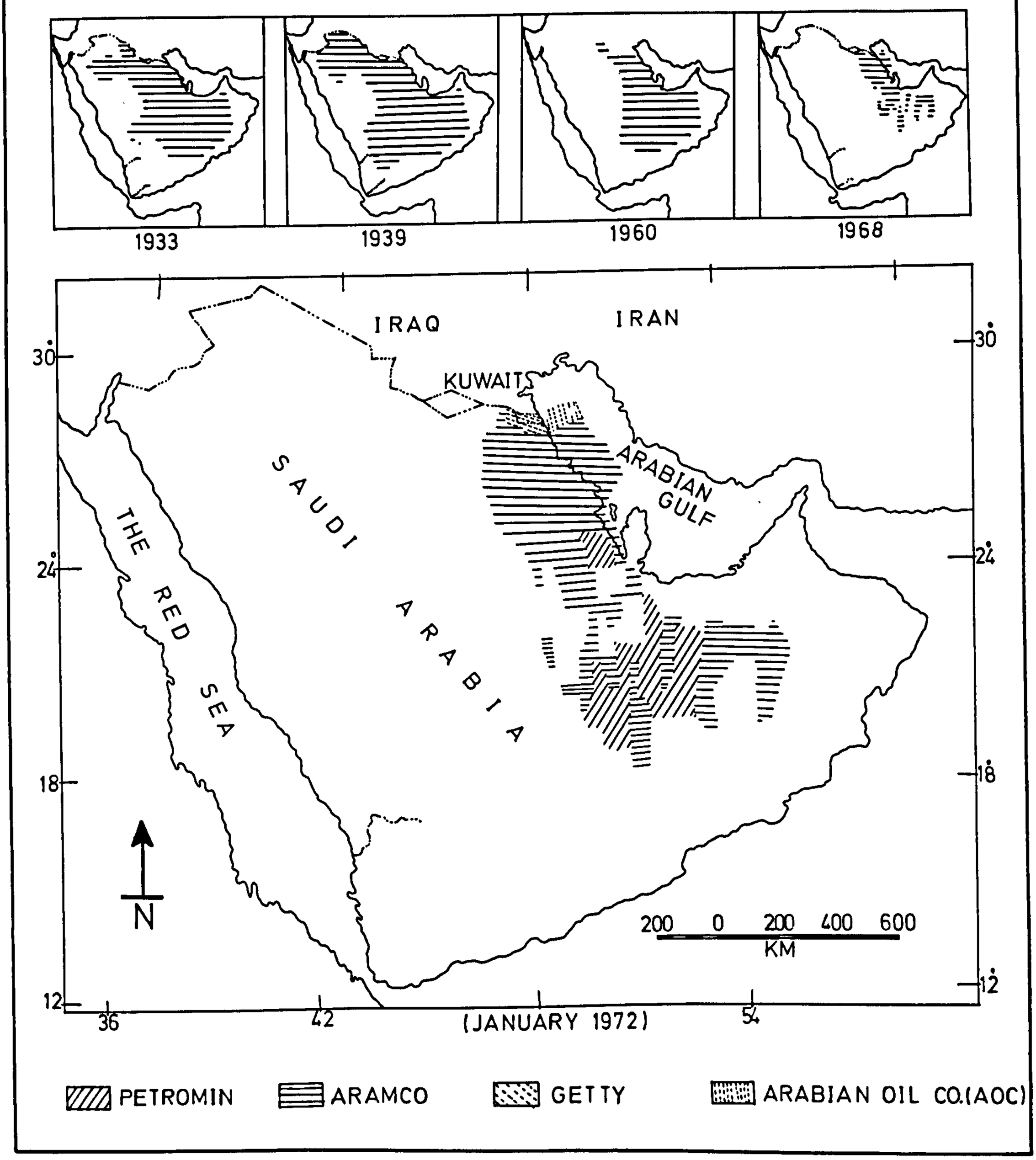


TABLE 6.1

OIL FIELD DISCOVERED BY ARAMCO UP TO 1972

Field	Date	Site	Field Area by Acre	Average Depth by Feet	Flowing Wells	Type of Oil	API* Gravity	Gas-Oil Ratio average Cu.ft per barrel	Crude Oil reserve in millions
Dammam	1938	On shore	12,000	4,620	23	Sour	34	385	647
Abu-Hadriyah	1940	On shore	25,000	9,930	7	Sour	28,35,38	57,64,260	1,033
Abqaiq	1940	On shore	124,000	6,670	74	Sour	29,37,38	130,860	844
Qatif	1945	On shore	73,000	7,050	21	Sour	31,38,42	330,870,1266	4,704
Ghawar	1945-57	On shore	1,000,000	6,700	192	-	-	-	80,308
Fadhili	1949	On shore	14,000	8,110	3	Sour	37,40	750,900	935
Safaniyah	1951	Offshore	125,000	5,150	83	Sweet/Sour	27,31,32	220,70,240	20,518
Khursaniyah	1956	On shore	20,000	6,570	10	Sour	31	120,306,55, 347,350	2,193
Khurais	1957	On shore	188,170	5,100	9	Sour	33,36	248,400	7,653
Manifa	1957	Offshore	83,000	6,950	5	Sour	29	485	7,200
Abu-Sa'afa	1963	Offshore	25,000	6,650	8	Sour	19,30,34	34,74	3,142
Berri	1964	Offshore	64,000	4,450	13	Sour	33,38	140,400,800	5,455
Zuluf	1965	Offshore	45,000	-	-	Sweet	28,32,34	90,100,350 390,750	2,767
Marjan	1967	Offshore	8,500	-	-	Sour	32,34,35	725,1220,235	673
Karan	1967	Offshore	-	-	-	Sour	24	40	10
Jana	1967	Offshore	-	-	-	Sour	34	44	44
Shaybah	1968	On shore	40,000	-	-	Sweet	42	800	1,828
Juraybiat	1968	On shore	-	-	-	Sour	27	60	2
Harmaliyah	1971	On shore	-	-	-	-	-	-	-
Mazalij	1971	On shore	-	-	-	-	-	-	-

Source: Ministry of Petroleum - Aramco

* (API) American Petroleum Institute

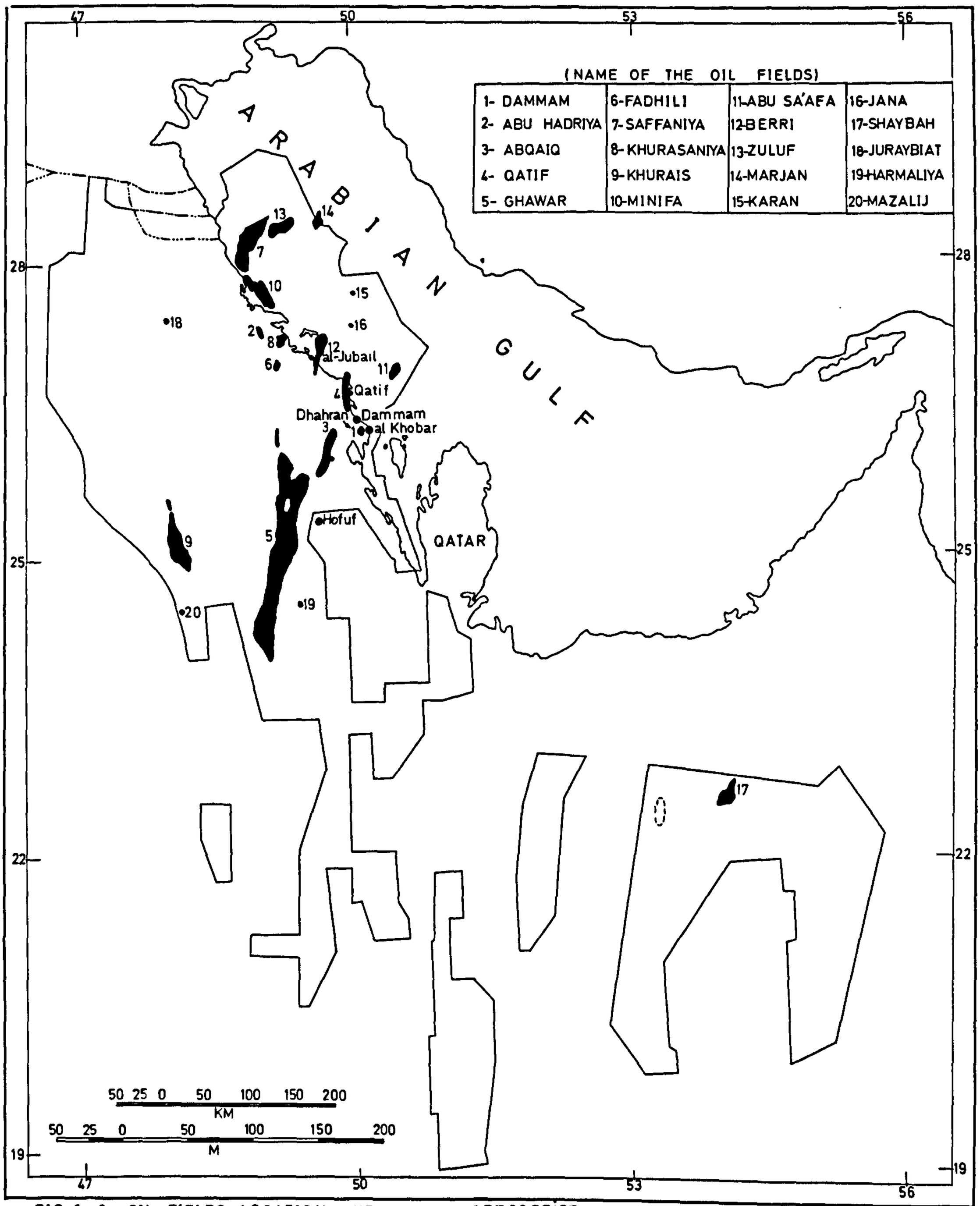


FIG 6.2 OIL FIELDS LOCATION AND ARAMCO CONCESSION IN THE EASTERN PROVINCE (AT JAN. 1972).

TABLE 6.2
CRUDE OIL PRODUCTION 1938-72 (BY BARRELS)

Year	Annually	Daily	Daily Change	
			No.	%
1938	495,135	1,357	-	-
1939	3,933,903	10,778	9,421	694.3+
1940	5.074,838	13,866	3,088	28.7+
1941	4,310,110	11,809	2,057	14.8-
1942	4,530,492	12,412	603	5.1+
1943	4,868,184	13,337	925	7.5+
1944	7,794,420	21,296	7,959	59.7+
1945	21,310,996	58,386	37,090	174.2+
1946	59,943,766	164,229	105,843	181.3+
1947	89,851,646	246,159	81,940	49.9+
1948	142,853,989	390,309	144,140	58.6+
1949	174,008,629	476,736	86,427	22.1+
1950	199,546,638	546,703	69,969	14.7+
1951	277,962,605	761,541	214,848	39.3+
1952	301,860,885	824,757	63,216	8.3+
1953	308,294,245	844,642	19,885	2.4+
1954	347,844,850	953,000	108,358	12.8+
1955	352,239,912	965,041	12,041	1.3+
1956	360,923,384	986,129	21,088	2.2+
1957	362,121,478	992,114	5,985	0.6+
1958	370,485,754	1,015,029	22,915	2.4+
1959	399,820,590	1,095,399	80,370	7.9+
1960	456,453,173	1,247,140	151,741	13,9+
1961	508,269,201	1,392,518	145,378	11.7+
1962	555,055,388	1,520,703	128,185	9.2+
1963	594,591,671	1,629,018	108,315	7.1+
1964	628,094,543	1,716,105	87,087	5.3+
1965	739,077,565	2,024,870	308,765	18.0+
1966	873,349,148	2,392,737	367,867	18.2+
1967	948,110,468	2,597,563	203,826	8.6+
1968	1,035,773,333	2,829,982	232,419	8.9+
1969	1,092,321,543	2,992,662	162,680	5.7+
1970	1,295,335,759	3,548,865	556,203	18.6+
1971	1,641,615,332	4,497,576	948,711	26.7+
1972	2,098,422,603	5,733,395	1,235,819	27.5+

Source: Aramco

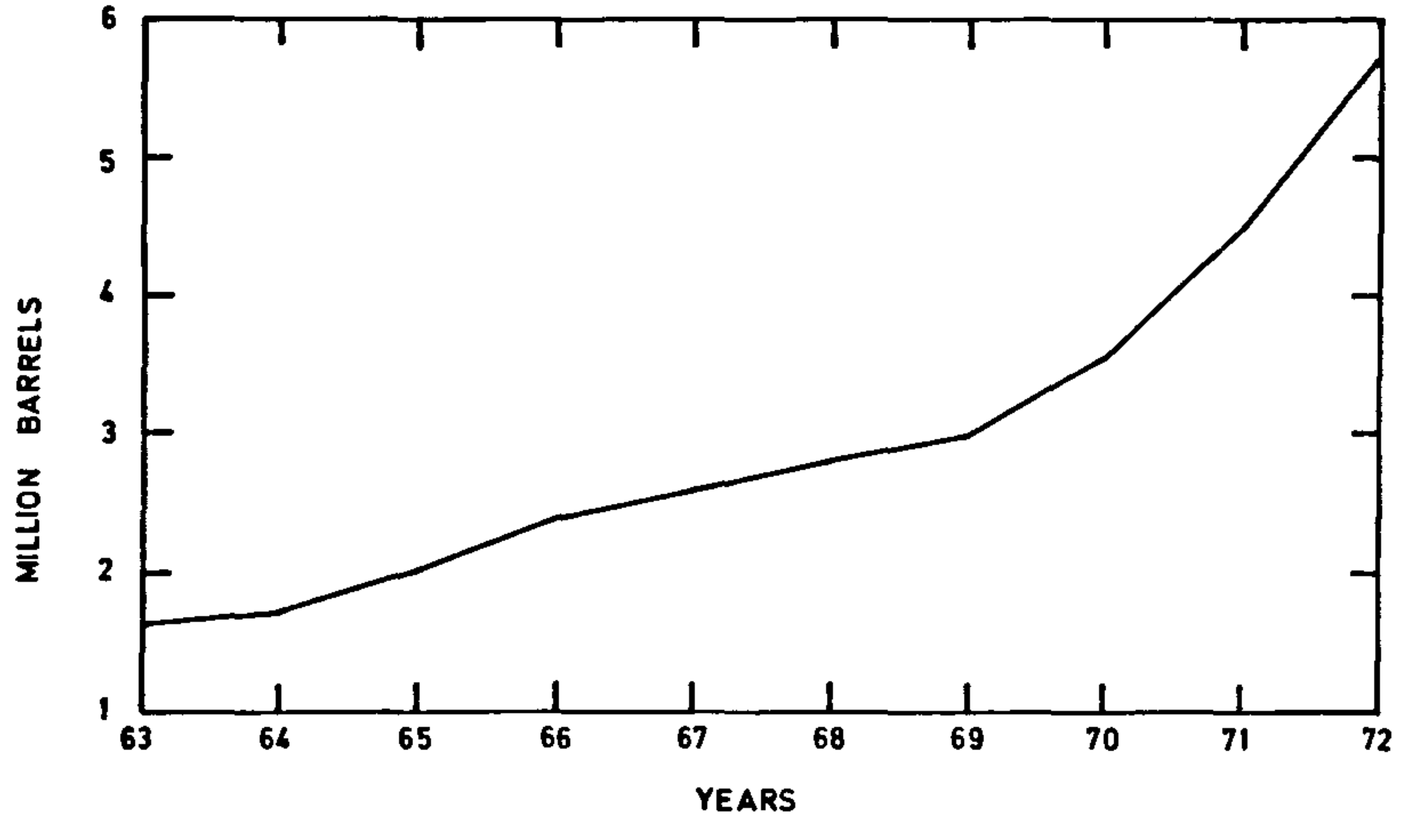


FIG.6·3. Daily crude oil production in Saudi Arabia (1963-72)(Million Barrels)

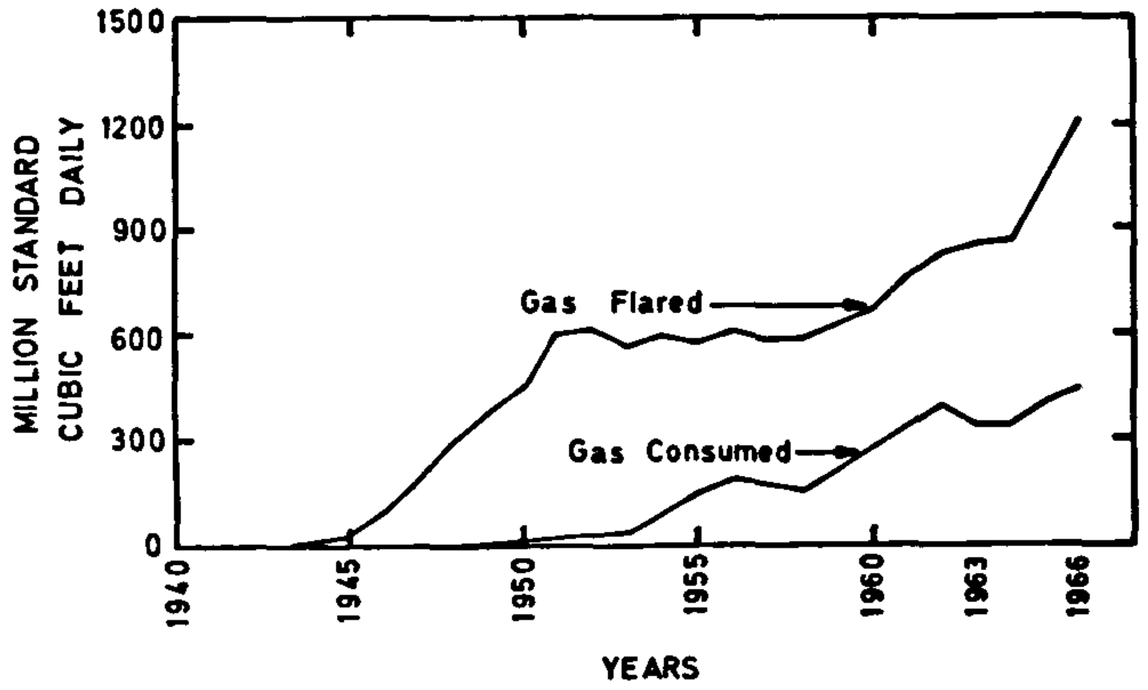


FIG.6·4. Production of natural gas in the Eastern province.

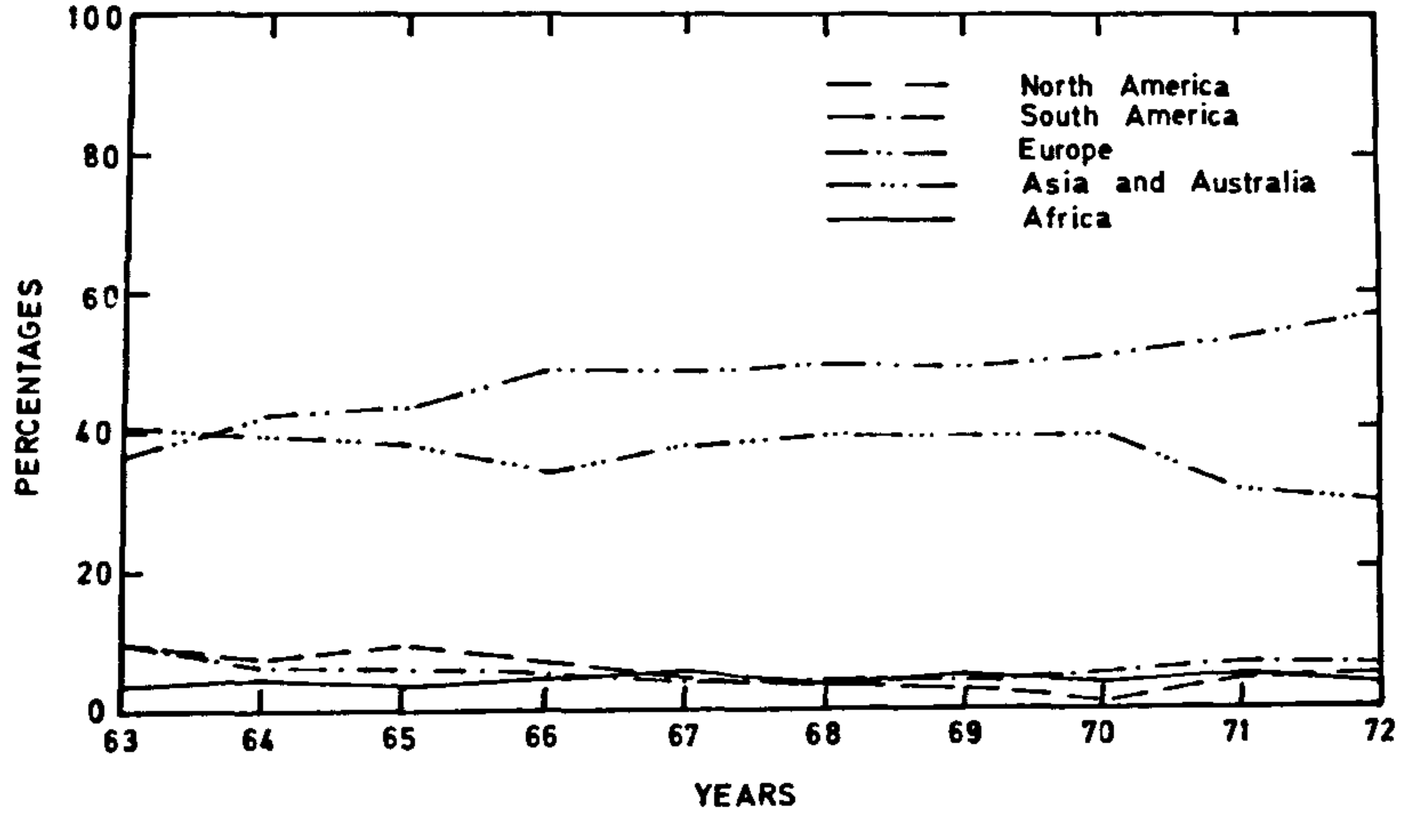


FIG.6·5. Distribution of Aramco's exports of crude oil and petroleum products to world markets (1963-1972)

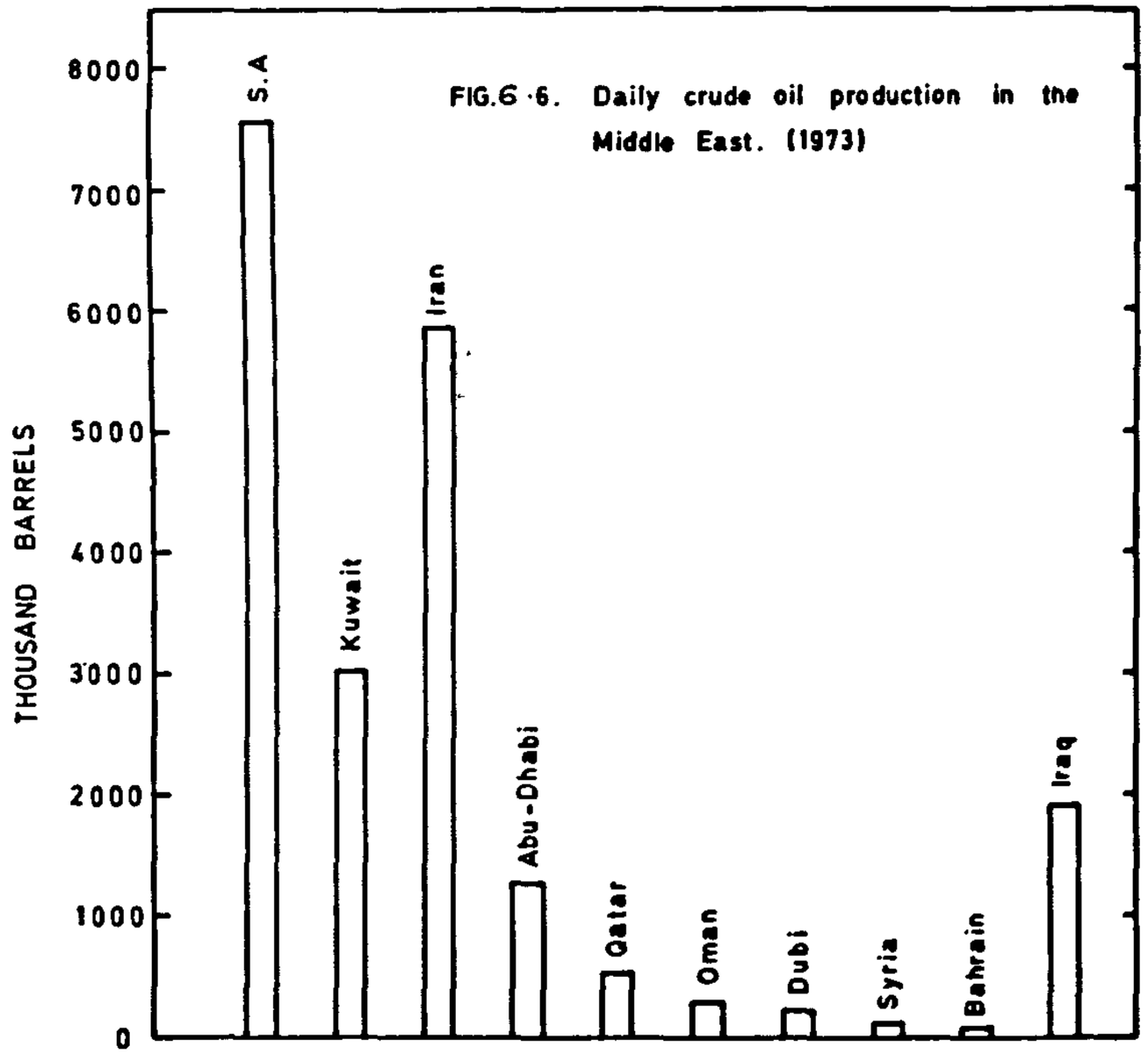


FIG.6·6. Daily crude oil production in the Middle East. (1973)

distributes LPG to retailers throughout the country. Additionally Aramco continued to supply natural gas to local industries, including the fertiliser industry, and the Saudi and Dhahran Electric Power Companies.[3] The system of domestic consumption of gas is by cylinder units. These are distributed by the local retailers in the cities and there are no networks of pipes supplying gas to domestic consumers.

In 1963 Saudi Arabia's share was 26.4% of the Middle East crude oil and 7.2% of the world crude oil production. In 1973 this rose to 36.2% of Middle Eastern production and to 13.3% of the world oil production. The annual rate of increase since 1968 was 18.2% while the increase in 1973 was 25.6% more than the 1972 total of crude oil production.[4] 95.0% of Saudi Arabian oil production is exported as crude oil.

This brief sketch of the growth of the exploitation of the petroleum resources of the Eastern province contains two facts of immense significance to the evolution of settlements in the region. In the first place, the location of the oil-fields of earliest importance directly attracted economic activities of many kinds to the area centred on Dammam and this same area has remained centrally positioned in the north-south zone of more recently discovered fields. Given also the location of this early and now central area, oil exploitation close to the Gulf coast and therefore relatively cheaply linked by sea transport to export markets has in general encouraged the continued and unbroken growth of economic activity in the same area.

Secondly, the globally and regionally significant exploitation of oil in the Eastern Province only really started after 1944 after which there came an economic revolution not only based on the direct regional effects of oil production but also on the indirect effects on the region of a vast increase in national wealth and the consequent activities of central government.

In one small coastal region of the Eastern Province therefore, within thirty years, a new centre of economic attraction - through

employment in the oil fields, through the growth of the supporting industrial and other services, has appeared. At first almost a province of the oil company, the region then becomes a focus of national state attention, through urban planning, investment in communications and the provision of public utilities and social services.

From 1944 onward, the previously important oasis settlements of Qatif and Hofuf become overshadowed by the new central region, Hofuf, in particular, as the more distant from the early oil centre being more negatively affected than Qatif (see Chapter[4] for the migration effect)

2. The Oil Industry
Liquified Petroleum Gas

There are three plants, two at Abqaiq and one at Ras-Tannura with a daily capacity of about 51,000 barrels.

The extraction of oil is of course only the first step and associated with oil resource exploitation are a number of industrial activities. The first group of these are associated with the first treatment of oil and storage. The 33 injection plants are located in the fields purely on technical grounds. The 49 Separator plants for the breakdown of the mixture of extracted oil and gas are also located on a least-cost basis for handling the well-head products. Both of these demand labour and servicing inputs but have no direct effects on settlement location.

The storage and transport of the separated oil and gas however have more complex locational characteristics. Crude oil on the scale produced has been from the beginning destined for foreign markets. Oil pipelines, pumping stations and storage facilities were therefore located primarily for facilitating low cost export.

Each pumping station as on Tapline has become a small functional settlement as noted in (Asad Abdo Ph.D. Thesis)[5]. Much more significant have been the developments at the port of Ras Tannura but these also have remained extremely specialised and no true urban settlement has grown

around the oil terminal; only the small residential area of Rihaima.

Storage

Ras-Tannura Refinery contains about 160 tanks with a total capacity of approximately 6 million barrels. In addition there are 95 tanks at the shipping terminal with a total capacity of about 9,783,900 barrels.

In addition to the tank farms at the refinery and terminal, there are a number of smaller tank farms for crude oil storage, at Abqaiq, Dhahran and Nariya.

and Main Oil Pipelines

The pipelines running through the Eastern Province are of varying sizes. Often there are two or more pipe diameters, a method first used in Saudi Arabia when the trans-Arabia pipeline was constructed in 1948-50. The pipeline linked the oil wells with all oil plants, refineries, storage and terminals shipping.[6] (See Fig. 6.7)

3. Oil Transportation

The crude oil of Aramco goes from the wells to the reservoirs in the fields, and is then, as crude oil, moved in five ways.

(a) To Ras-Tannura refinery

(b) To the pipeline (Tapline) at Qaisuma, in the north-west of the province.

(c) To Ras-Tannura port for shipping by tankers.

(d) To Bahrain refinery, via the pipeline, for processing.[7]

(e) To the storage tanks for local distribution and company operations.

The export of crude oil and its refined products to world markets is by three methods. By far the greatest portion (approximately over 90%) is loaded aboard tankers at the terminal of Ras-Tannura. 6% of the crude oil is piped to Qaisumah and from there pumped to the port of Sidon in the Lebanon, on the Mediterranean Sea. The remaining 3% of total oil production is piped under water to Bahrain in the Arabian Gulf.[8]

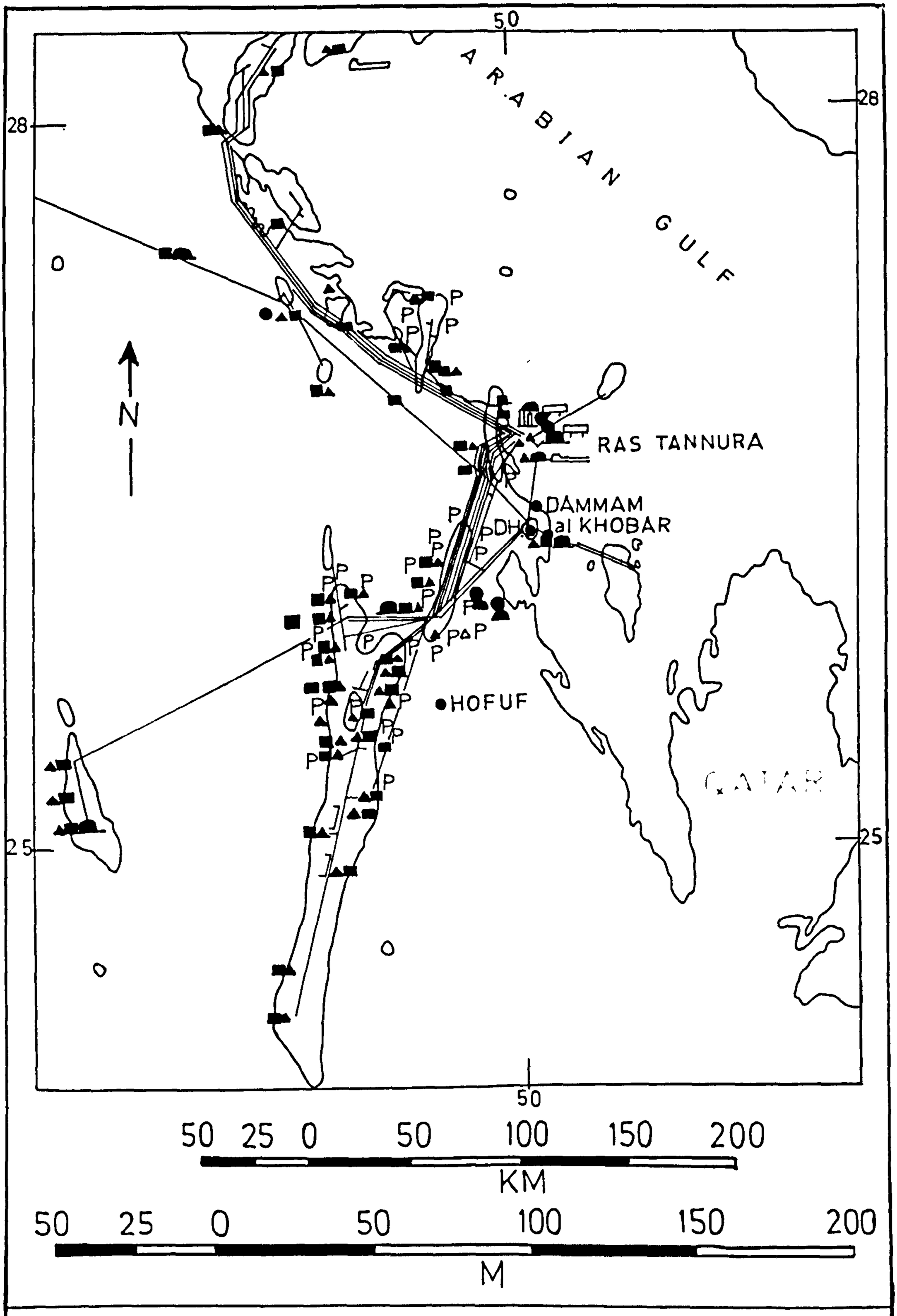


FIG. 6 . 7 OIL INSTALLATIONS IN THE EASTERN PROVINCE.

(i) By tankers via the port of Ras-Tannura; this port is the largest devoted exclusively to the shipping of petroleum. In 1972 3,734 ships were loaded with about 1,877 million barrels of crude and refined oil for markets in 65 different countries. By 1972 the number of ships had increased by 39% over 1966. (See Table 6.3 showing the number of ships loaded at Ras Tannura port for the seven years 1966-72).

TABLE 6.3

SHIPS LOADED AT RAS TANNURA PORT AND THE OIL SHIPPING

Year	No. of Ships	Crude Oil (barrels)	Products (barrels)	% of annual increase of ships	Daily Average of ships loaded	Capacity average of each ship
1966	2,677	538,493,120	108,419,987	12.0	7	241656
1967	2,694	637,580,523	115,748,715	0.6	7	279632
1968	2,783	663,566,955	141,180,019	3.3	8	289165
1969	2,873	761,009,838	148,227,855	3.2	8	316477
1970	3,170	969,291,561	196,312,622	10.3	9	367698
1971	3,407	1,252,572,383	180,407,995	7.4	9	420599
1972	3,734	1,684,343,473	192,775,228	9.6	10	502710

Source: Aramco

(ii) By Tapline. The Tapline pipe-line system extends approximately 1,222 kilometres from Qaisumah to the Lebanon and runs through four countries - Saudi Arabia, Jordan, Syria and Lebanon, to the oil storage tanks in Sidon. At Sidon port it is fed to the tankers. In 1972 445 ships were loaded at Sidon with a total of 164,296,457 barrels of crude oil.[9]

(iii) By the Arabian-Bahrain Pipeline which extends from Dhahran field 22 kilometres to Al-Aziziyah, just off-shore in the Arabian Gulf and then 42 kilometres under the sea to Bahrain refinery. The average sustained daily capacity to the system is 200,000 barrels. In 1972 60,694,750 barrels of crude oil were pumped to Bahrain representing 2.9% of ARamco's total production.[10]

The Dammam-Dhahran-Ras-Tannura zone is thus the nodal point for the oil movements whether by land or sea.

4. Refinery and Oil Manufacturing

There are four oil refineries in Saudi Arabia; Aramco refinery in Ras Tannura refines about 89.6%; Getty oil refinery at Saud Port (Mina) in the divided zone (Saudi-Kuwait Zone) refines 5.4%; Al-Khafji refinery refines 4.0% and Jeddah refinery refines 1.0% of the total Saudi crude oil for refining.

Ras Tannura is the principal refinery in Saudi Arabia, and is located on the site of the Aramco shipping terminal in Ras Tannura peninsula in the Arabian Gulf, about 70 kilometres north of Dhahran. The refinery came into operation after the end of the second world war in 1945, and it is one of the largest in the Middle East and the entire world. The average crude capacity of the refinery is over half a million barrels per day. (See Table 6.4 showing runs of the crude oil through Ras Tannura refinery).

TABLE 6.4
RUNS OF CRUDE OIL THROUGH RAS TANNURA REFINERY

Year	Annually	Daily
1963	98,504,137	269,874
1964	103,670,531	273,253
1965	115,561,344	316,606
1966	118,129,925	323,644
1967	126,829,601	347,478
1968	153,175,469	418,512
1969	161,442,887	442,309
1970	213,502,688	584,939
1971	203,981,443	558,853
1972	205,297,935	560,923

Source: Aramco

The refinery also has power plants, 11 water wells for the needs of the refinery, some 170 tanks (large and small) with a total capacity of 6,000,000 barrels of crude oil products, and water. The power plants are to provide power for the refinery, the terminals and the community in Ras Tannura. They also provide steam for heating and processing in the refinery units and for the operation of five

steam turbines. The total generating capacity is 63,750 kw; seven boilers can provide 1,770,000 pounds of steam per hour.[11]

The refined products of Ras Tannura refinery are fuel oil, gasoline, diesel oil, liquified petroleum gas, jet fuel, kerosene, asphalt and other miscellaneous items. The main product is fuel oil, which averaged approximately 54.0% of the total production of the refinery; asphalt accounted for the lowest proportion - less than 1%, since Aramco does not export asphalt but produces only a small amount for its own needs, and the needs of the country. With the growing demand for paved streets and roads in the cities and towns, the production of asphalt will have to be increased.

The output of these products on the whole, is static and has shown no increase over the last few years. (See Table 6.5)

TABLE 6.5

PERCENTAGE OF THE PRINCIPAL PRODUCTS MANUFACTURED FROM RAS TANNURA REFINERY

Product	1965	1966	1967	1968	1969	1970	1971	1972
Fuel Oil	58.2	53.5	53.3	51.8	51.8	54.6	54.6	52.7
Gasoline	15.8	15.9	16.9	16.7	16.4	16.5	15.4	16.9
Diesel Oil	11.6	14.2	13.4	12.7	11.7	10.1	11.1	11.3
Jet Fuel	7.6	9.1	7.8	8.9	9.0	6.7	6.7	8.2
Liquified Petroleum Gas	4.6	5.0	5.5	7.2	8.5	8.2	9.0	7.9
Kerosene	2.0	1.7	2.4	2.1	2.0	3.3	2.7	2.5
Asphalt/miscellaneous	0.2	0.6	0.7	0.6	0.6	0.5	0.5	0.5

Source: Aramco

5. Local Consumption of Refined Products

Until recently the local consumption of refined products was mainly under the control of Aramco, which owned storage tanks and distribution facilities throughout Saudi Arabia. The operation of marketing and distribution of the products inside Saudi Arabia is now made by the General Petroleum and Mineral Organisation (Petromin). The products supplying the local markets are from the refinery at Jeddah for the Western Province, and from Ras Tannura refinery for markets in the Central, Eastern and Northern Provinces. The annual increase in the consumption of petroleum production

is about 15.4% in the domestic market. (See Table 6.6 and Fig. 6.8 showing local consumption in different provinces of Saudi Arabia by thousand barrels for 1962-72).

The Eastern and Western Provinces are the major local markets; in 1972 about 66.0% of total production was consumed by these two provinces, the remainder being consumed by the rest of the country.

TABLE 6.6

LOCAL CONSUMPTION OF THE PETROLEUM PRODUCTS (THOUSAND)

Province	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
Eastern	2163	2452	2953	3687	4366	4505	5632	5878	4624	5296
Central	670	410	307	460	447	333	295	1044	2653	3325
Western	2489	2829	2853	3852	4418	5272	5900	6603	7036	7938
Northern	26	421	479	761	514	145	913	1991	2879	3489
Others	6	139	543	877	1346	3062	1487	-	-	-
TOTALS	5354	6251	7135	9637	11091	13317	14227	15516	17192	20048
% Change	9.8+	16.8+	14.1+	35.1+		15.1+	20.1+	6.8+	9.0+	10.8+	16.6+

Source: Statistical Year Book 1973
Ministry of Petroleum.

The Eastern Province alone consumed about 26.4% of the total production in 1972, and the main consumption centre is Dammam area which includes Dammam, Al-Khobar and Dhahran cities. This area takes 61.7% while Hofuf area accounts for 4.3% of the total consumption of the province. Qatif area, including all the oasis towns and villages, and Al-Jubail area ranks second to Dammam area, with 25.6% of the total consumption, the remainder being consumed by Abqaiq (2.6%) and Al-Safaniya area (5.8%). The growth in the consumption of petroleum products in the province has been increasing rapidly every year, particularly in Dammam area, where consumption increased from 1597 thousand barrels in 1963 to 3267 barrels in 1972, with percentage increases of about 104.6%, and also Qatif area (the nearest to Dammam) increased between 1963-72 from 376 to 1354 thousand barrels, a percentage increase of 260.1%. In Hofuf area, the increase is not so great; here consumption has increased from 129 in 1963 to 230 thousand barrels in 1972,

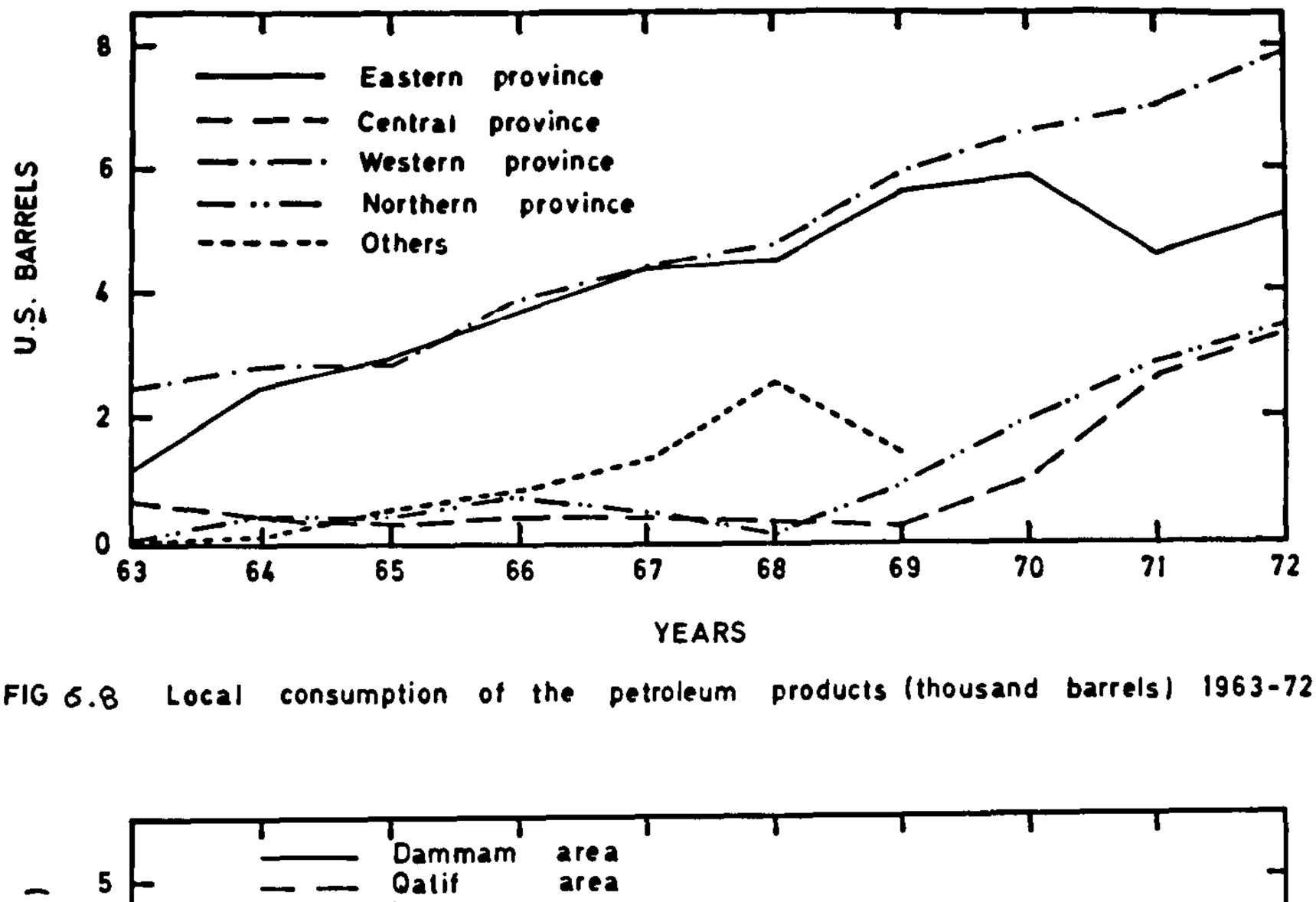


FIG 6.8 Local consumption of the petroleum products (thousand barrels) 1963-72

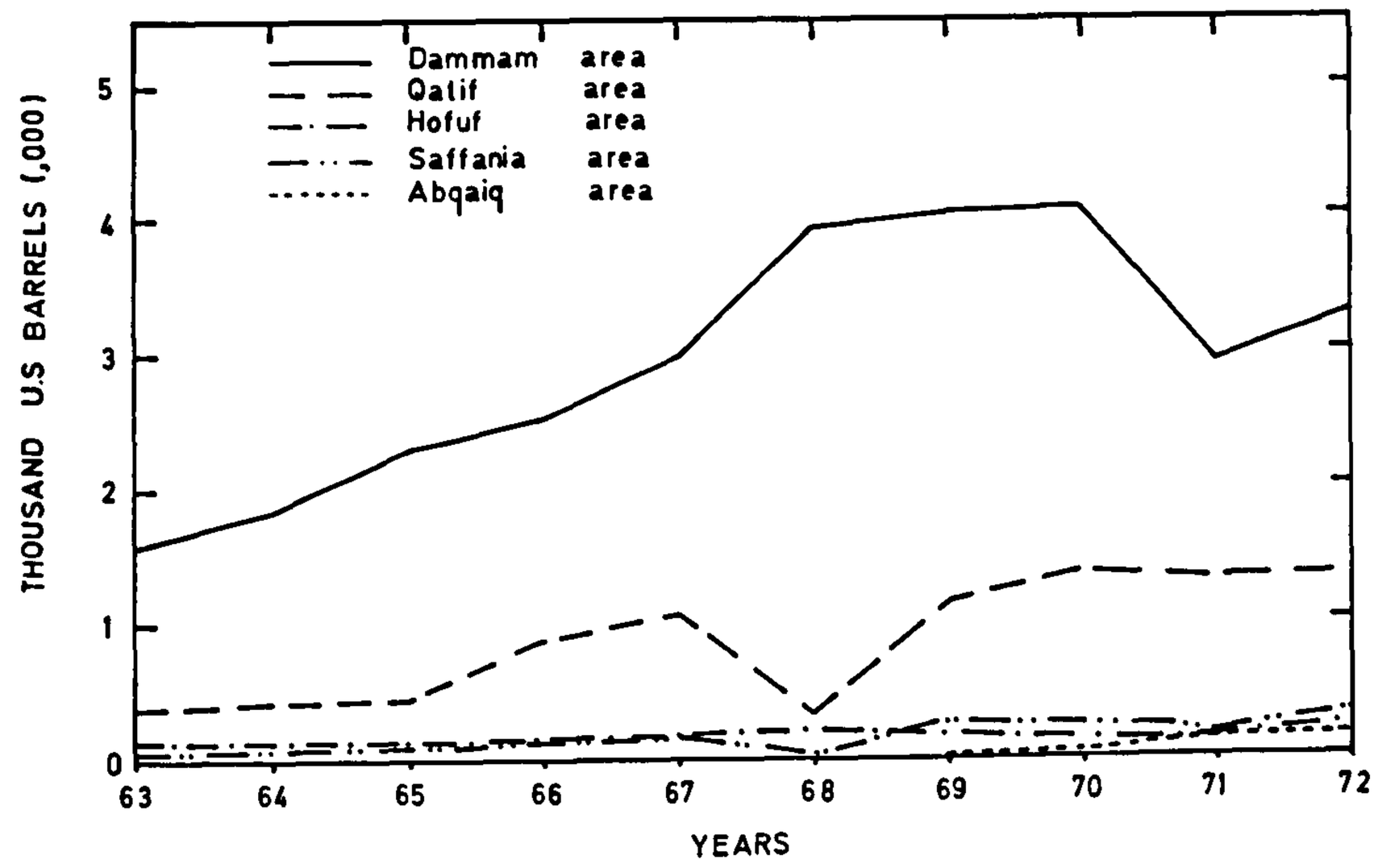


FIG. 6.9. Oil consumption quantities within the Eastern province (thousand U.S. barrels) (1963-72)

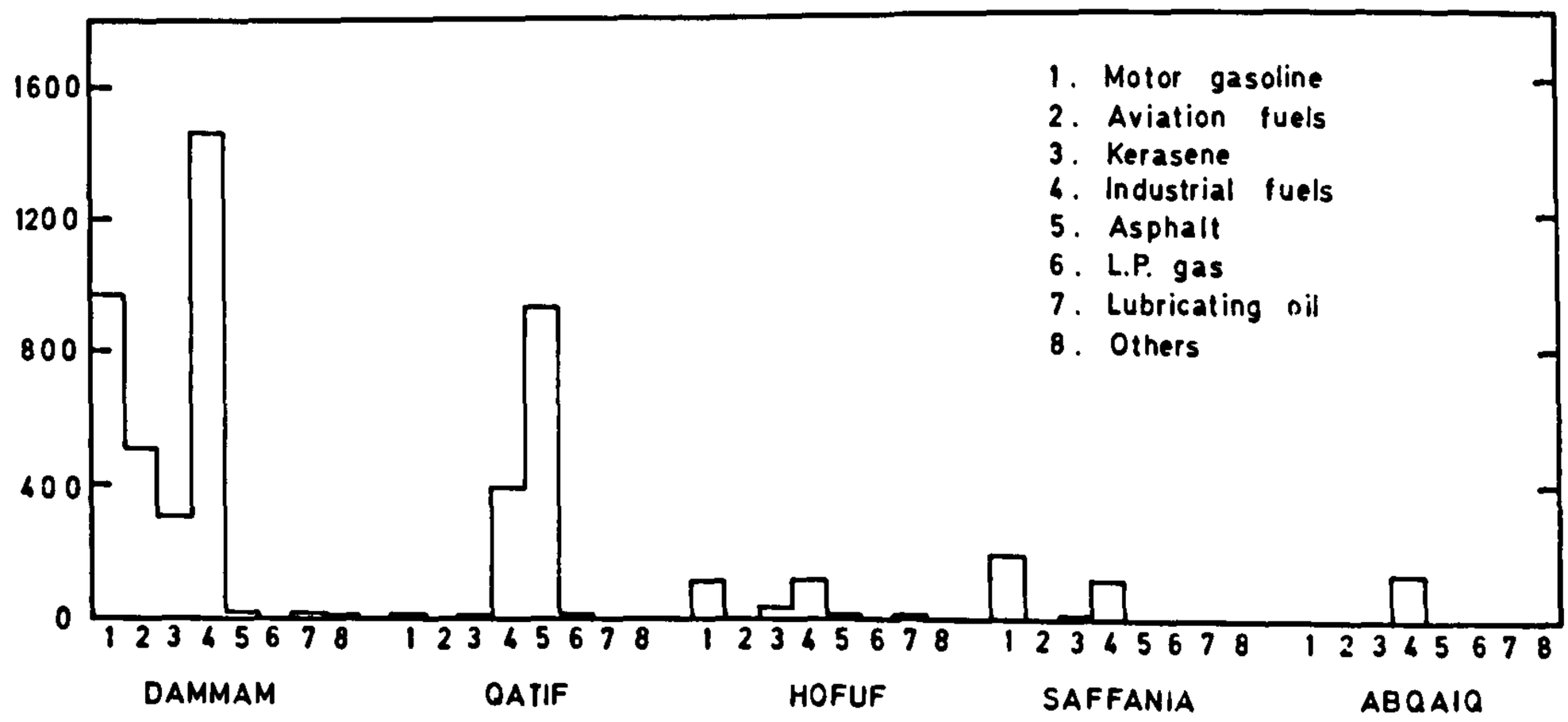


FIG. 6.10 Type of oil products consumed in the Eastern province 1972 (thousand barrels)

a percentage of increase of about 78.3% after nine years. (See Table 6.7 and also Fig. 6.9 showing consumption by area in the Eastern Province from 1963 to 1972).

The reasons for the fast growth rate in consumption in the Dammam and Qatif areas derive from the fact that the industrial sector (@il and private) is the major consumer of petroleum products and these sectors are most strongly represented here.

TABLE 6.7

OIL CONSUMPTION VOLUME IN THE PROVINCE BY AREA (THOUSAND BARRELS)

Area	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
Dammam	1597	1854	2270	2502	2970	3921	4026	4076	2908	3267
Qatif	376	408	447	887	1062	327	1167	1383	1310	1354
Hofuf	129	127	144	155	178	215	171	129	114	230
Safaniya	40	63	92	143	156	42	257	252	158	309
Abqaiq	21	-	-	-	-	-	-	-	-	-
TOTALS	2163	2452	2953	3687	4366	4505	5632	5878	4624	5296
% Change	-	13.4+	20.4+	24.9+	18.4+	3.2+	25.0+	4.4+	21.3-	14.5+

Source: Statistical Year Book 1973.

The most important group of petroleum products consumed in the province is industrial fuels (about 41.8% of the total). The major centres of the consuming industries are in Dhahran, Ras Tannura and Abqaiq. The second type of product consumed is motor gasoline (24.0% of the total), mainly in Dammam area. (See Fig. 6.10 showing the types consumed in the province by areas in 1972).

B. Chemical and Petrochemical Sector

The chemical and petrochemical industry is second in importance only to the oil industry, based on the use of natural gas, as a source of energy and as a raw material. In the Eastern Province a considerable number of industries have been established using local supplies of gas for fuel, as in cement, electricity and glass plants. Others produce bulk products such as raw sulphur, and fertilisers, but these industries located in Dammam and Al-Khobar, produce a range of finished products, e.g. wrapping materials, insecticides, deodorants, liquid soap, cloth

cleaner, many types of paints and solution and acids, plastic glasses, foam rubber and synthetic gases.

The main chemical and petrochemical plants in the province are as follows:

1. Fertiliser Plant (SAFCO)

The idea of producing chemical fertilisers appeared in 1947 when Petromin was established. After undertaking various studies of the possibilities of utilising natural gas in 1967, the first plant was established. The plant was situated at the Petromin industrial zone on the Dammam-Al-Khobar road, and near the railway and Dammam port. It occupies an area of about two million square feet, and its capacity is 1100 metric tons of Urea, 600 tons of Ammonia and from 35 to 50 tons of raw sulphur per day.[12] SAFCO has two large storage tanks for ammonia with a total capacity of about ten thousand tons, and storage capacity for Urea of approximately seventy-five thousand tons, and also has a power station, with an output of 26,500 Kwh to provide its own electricity. The fertiliser plant commenced commercial production of 92,250 tons in 1971, for both the local and export markets. For the purpose of marketing abroad, the plant has been linked by the railway line with the King Abdulaziz berth at Dammam port for shipping to world markets, e.g. to Kuwait, Qatar, Bahrain, Yemen, Sudan, Afghanistan, India and Pakistan.[13] 51.0% of this company is owned by Petromin, the remaining 49.0% being owned by private Saudi investors. With a capital investment of about SR 90 million (20 million US dollars) it employs 523 workers, of whom 320 are Saudi Arabian.[14]

2. Petromin Sulphur Plant

This plant was established because natural gas is produced at all the oil fields (with the exception of Safaniya) and this gas contains a high percentage of hydrogen sulphide gas. Established at Abqaiq in 1970, the plant has an average daily output of 500 tons of liquid sulphur, which will be processed into flaked sulphur. The amount of gas required

by the plant is about 500 million cubic feet per day, to produce approximately 150,000 tons of sulphur a year. The product is sent by rail to Dammam port for shipping to world markets. The capital investment in this plant is SR 45 million, and the number of employees is approximately 140, of whom 100 work at the plant in Abqaiq, the remainder being employed at the company's headquarters in Dammam.[15]

3. Petromin H_2SO_4 (Sulphuric Acid) Factory

Established in 1971 at the Petromin industrial zone in Dammam, the main purpose of establishing this plant was to supply sulphuric acid to the fertiliser plant, Aramco distillation plants (at Al-Khobar in the Eastern Province, and Jeddah in the Western Province), and also the local markets. The process of sweetening (desulphurising) the natural gas gives approximately 17 tons of sulphur a day, to produce an average of 50 tons a day, or 16,500 tons per annum.[16] The capital investment for the factory is SR 533,000 and 22 workers are employed.

4. Gas Products Plant

Thère are two companies in the Eastern Province, one of these in Al-Khobar, established in 1955. The company has two plants, the first producing oxygen, medical oxygen, nitrogen, compressed air, carbon dioxide, dry ice, and acetylene (for welding and lighting). The other plant is for the imported gases and refrigeration gases, such as ammonia helium, argon (for welding), hydrogen, nitrous oxide, cyclopropane, welding equipment, extinguishers, CO_2 and calcium carbide. The daily total production for both plants is about 15,312 cubic metres of nitrates and oxygen; 360 kilos of liquid acetylene and 3600 kilos of carbon dioxide.[17] The capital investment of the company is SR 5 million and 126 men are employed by this firm.

The second company, established in 1961, is situated on the Dammam industrial estate. It also has two plants; one for oxygen, nitrogen and carbon dioxide gases and liquid oxygen and nitrogen, and has a production capacity of 115 cubic metres per hour. The other plant is for the

production of acetylene gas, and it has a daily capacity of 450 kilos, which could be increased to 900 kilos a day.[18]

The remaining plants of the chemical and petrochemical industry in the Eastern Province have almost all been established before 1971 (See Table 6.8).

C. Other Industries (including Public Utilities)

Apart from the oil industry, industrial development in the Eastern Province started in the 1960's when the first small-scale gas industry was established at Al-Khobar in 1955. From 1961 until the present day the growth rate of industry was very rapid, approximately 94.0% of the total number of industries being established during the period between 1961 and 1971, and many more are now being studied by the government. Generally the government has helped the industrial sector by issuing decrees to help their establishment, and founding the proper institutions necessary to aid industrial development.

The industries other than chemical and petrochemical are almost all privately owned and are many and varied, i.e. dairy products, sweets, date packing, soft drinks, ice, poultry foods, textiles and clothing, blacksmiths, garages, carpenters, aluminium and metal furniture, paper products, printing, bricks, flagstones, pipe coating, cement and other industries.

1. Industrial Estates

There are two industrial estates in the Eastern Province, one in the private sector of the Dammam industrial complex and the other in Dhahran. This is also a private estate, owned by Aramco.

(a) Dammam Industrial Estate

During the last few years the government has tried to develop the infrastructure for a well-organised industrial sector in the Province. At the Dammam estate many factories have already been established and have begun production. This estate has all the essential facilities such

TABLE 6.8

CHEMICAL AND PETROCHEMICAL INDUSTRY IN THE EASTERN PROVINCE

Factory	Location	Type of Product	Capacity	Date
SAFCO	Dammam	Fertilisers	1100 tons Urea & 35 tons raw sulphur a day	1967
Petromin, Sulphur Plant.	Abqaiq	Liquid sulphur	500 tons a day	1970
Petromin H_2SO_4	Dammam	Sulphuric acid	50 tons a day	1970
Wrapping Material Trade Company	Dammam	Plastic wrapping material	300 tons polythene bags a year	1969
National Plastics Factory	Dammam	Plastic glasses	8-12 million glasses a year	1971
Chemical Industries Saudi Company	Al-Khobar	Foam rubber	2.5 tons of foam rubber & 2-5 tons tons insulated material a day	1966
Dammam Establishment for Chemicals	Dammam	Liquid soap and shampoo	195 tons soap & 75 tons shampoo a year	1971
Chemical Company for Industry & Trade	Dammam	Insecticides, deodorant, cloth cleaner, liquid soap	223 tons liquid & powder insecticide, 15000 tons deodorant, 104 tons liquid soap, 93 tons liquid cloth cleaner a day	1971
Saudi Synthetic Gas Company	Al-Khobar	Synthetic gases	15312 cu.m nitrate & oxygen, 360 kg. liquid acetylene, 3600 kg. CO_2 a day.	1971
A. Hasheim Establishment	Dammam	Gas products	115 cu.m gas products per house; 450 kg. acetylene a day.	1961
Nevel Hemple Paints Saudi Company	Dammam	All types of paints	1250-4400 tons a year.	1971
Modern Acid and Filling Factory	Dammam	Solution & acid for car batteries	30,000 bottles a year.	1965
NaOH Factory	Dammam	NaOh, Cl, ClOH	3000 tons NaOH 400 tons Cl, 4800 tons ClOH a day	1968
Saudi Company for Battery Industry	Dammam	Batteries (liquid)	4500 batteries a year.	

Source: Ministry of Commerce and Industry, Riyadh

as electricity, water and sewage, and soon it will have a Post Office, Police and Fire Stations, Health Centre and banking services. The estate covers a total area of approximately 436,000 square metres and is expected to double in size in the near future. The area is divided into plots each with an average area of between 1000 and 4000 square metres for a factory, and from 100 to 1000 square metres for a workshop. The plots at the estate are almost rent free, a nominal rent of only £3.00 [19] a year being paid for each factory.

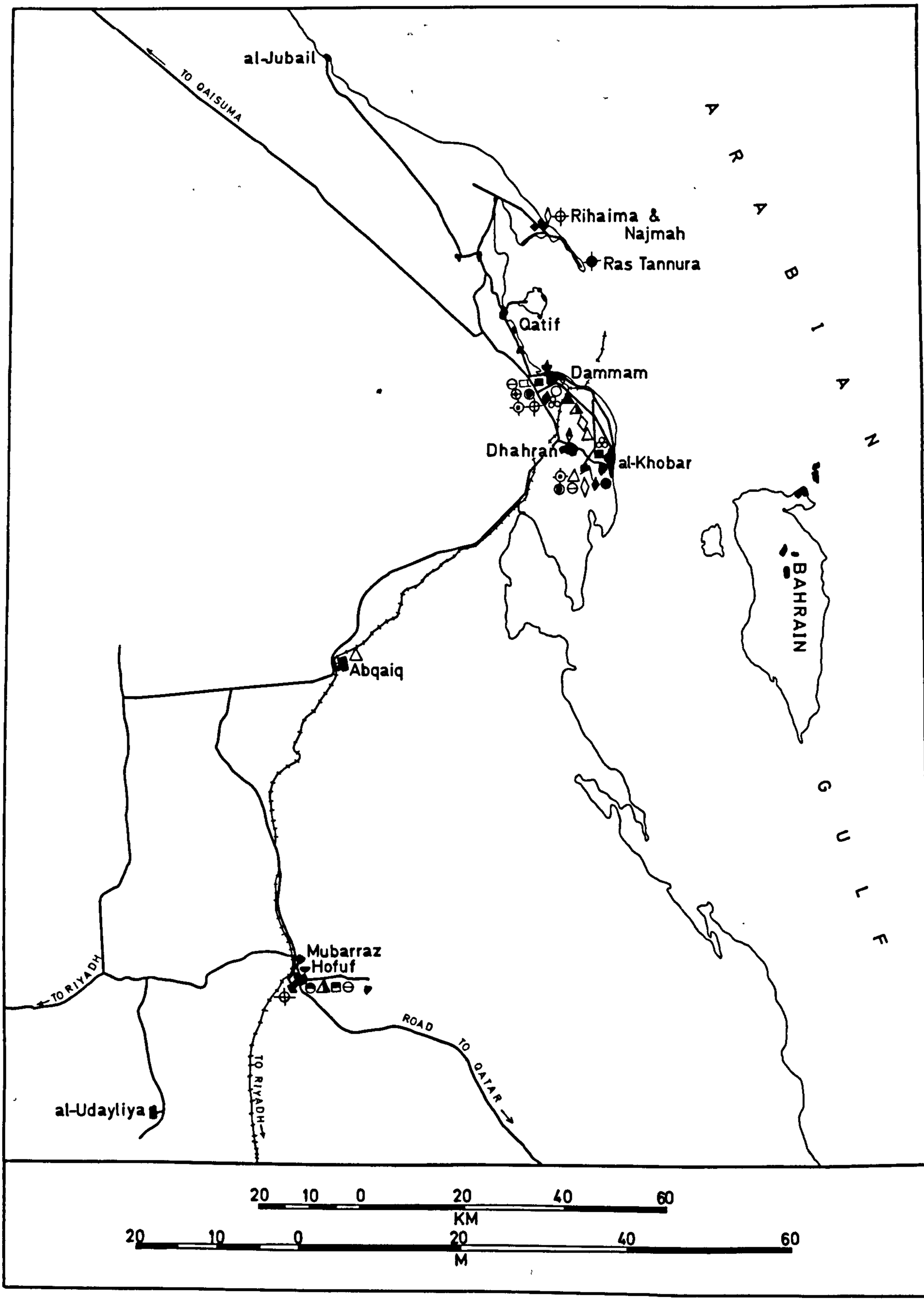
(b) Dhahran Industrial Estate

This is a private estate owned by the oil company (Aramco) for its own industries. The estate contains a consolidated workshops building for metal crafts (sheet metal, machine, pipe-fitting, electric welding, valve shop and blacksmiths). In addition there are two medical storage buildings, four warehouses, two storage areas and other buildings. The estate has a power plant, general commissary heavy duty maintenance shop, ice plant and offices. [20] The railway links both this estate and the Dammam estate with Dammam port.

2. Location and Classification of Industry

In the Eastern Province industry is mainly centralised in the three major cities, Dammam, Al-Khobar and Hofuf, in Al-Hasa Oasis, and associated with the location of the central offices of business and administration at these cities of the province, in particular Dammam and Al-Khobar, the most densely populated zones in the region. The industrial firms have been classified under the International Standard Industrial Classification (ISIC) including the oil refinery in Ras Tannura and chemical and petrochemical industries (See Table 6.9). Manufacturers thus classified all employ five or more workers. It can be seen from Table 6.9 that Dammam has the largest concentration of industry, 59.5% of the total firms being found there, due to the founding of the industrial estate and the sea port of Dammam (see Fig.6.11).

FIG. 6.11 LOCATION OF THE INDUSTRIAL HEARTLAND OF THE EASTERN PROVINCE.



KEY TO FIG.6·11

- CITIES AND TOWNS.
- MANUFACTURE OF DAIRY PRODUCTS.
- CANNING OF DATES
- CANNING OF FISH AND SHRIMPS.
- CONFECTIONERY AND SWEETS.
- MANUFACTURE OF MISCELLANEOUS FOOD PREPARATION.
- SOFT DRINKS AND CARBONATED WATER INDUSTRIES.
- SPINNING WEAVING AND TEXTILE FINISHING.
- MANUFACTURE OF CLOTHES.
- TURNERY AND CARPENTRY INDUSTRIES.
- GLASS INDUSTRIES.
- PAPER INDUSTRIES.
- PRINTING INDUSTRIES.
- CHEMICAL PETRO – CHEMICAL.
- PETROLEUM REFINERY.
- BRICKS AND TILE INDUSTRIES.
- MANUFACTURE OF CEMENT.
- METAL PRODUCTS INDUSTRIES.
- SHIP REPAIR INDUSTRIES.
- OTHER PROCESSING INDUSTRIES.
- ELECTRICITY.
- WATER PURIFICATION DESALINATION.

TABLE 6.9

LOCATION & CLASSIFICATION OF INDUSTRIAL FIRMS (BY ISIC) UP TO 1972

ISIC	Dammam	Al-Khobar	Dhahran	Hofuf	Abqaiq	Rihaimah and Ras Tannura	Total
202 Manufacture of dairy products	-	1	-	-	-	-	1
203 Canning and preserving of fruit	-	-	-	1	-	-	1
204 Canning and preserving fish & other sea foods	1	-	-	-	-	-	1
208 Confectionery & sweets	1	-	-	-	-	-	1
209 Manufacture of Miscellaneous food preparations	1	-	-	3	-	-	4
214 Soft drinks/carbonated water industries	5	2	-	-	-	-	7
231 Spinning, weaving and textile finishing	-	-	-	1	-	-	1
243 Manufactury of clothing (except footwear)	1	-	-	-	-	-	1
251 Turnery & Carpentry	1	1	-	-	-	-	2
260 Furniture industries	-	-	1	-	-	-	1
272 Manufacture of pulp, paper & paper board	1	3	-	-	-	1	4
280 Printing, publishing & allied industries	5	4	-	1	-	-	10
311 Chemical and petrochemical	9	3	-	-	1	-	13
321 Petroleum refineries	-	-	-	-	-	1	1
331 Brick/Tile Industry	11	2	-	-	-	-	13
334 Manufacture of Cement (hydraulic)	-	-	-	1	-	-	1
350 Metal Products Industry	3	1	-	-	-	-	4
381 Ship Repair industry	1	-	-	-	-	-	1
399 Other processing industries	2	-	-	-	-	-	2
511 Electricity industry	1	-	-	1	-	1	3
521 Water supply (purification)	1	1	-	-	-	-	2
TOTALS	44	17	1	8	1	3	74
Percentages	59.5	23.0	1.4	10.8	1.4	4.1	100

Source: Industrial Studies and Development Centre

3. The Major Industries

(a) National Dairy and Ice Cream Plant

This plant is one of three factories in Saudi Arabia. Established in 1967 it is situated at Al-Khobar and occupies a plot with an area of approximately 10,000 square metres, south of Al-Khobar. The plant produces milk, yogurt, ice cream and other dairy products. The annual production is 500,000 gallons of milk and yogurt, and 140,000 gallons of ice cream.[21] During the hot months the plant produces up to 17,000 gallons per week, and keeps a refrigerated truck constantly busy on the long road to Hofuf and Riyadh, and ships to Jeddah by air four times a week.[22] Capital investment in the dairy plant is SR 746,300 and will shortly increase to SR 4,049,069. About 40 men are employed at this plant.[23]

(b) Date Packing Factory

This is one of four date packing factories in Saudi Arabia, and is the oldest factory in Hofuf. It produces jam, vinegar and molasses of dates. The syrup of this molasses is being investigated as a sugar substitute in the manufacture of soft drinks. The total seasonal capacity is 400 tons, almost all of which goes to local markets in Saudi Arabia, but some is also exported to Arab countries and Spain. The capital investment for the factory is SR 771,000 and the factory employs 125 men.[24]

(c) Qusaibi Fish Project

The fish processing plant commenced work in Dammam in 1963 to collect and pack fish, and was one of the earliest export industries of the Eastern Province. The plant is made up of two units, one at Minife 250 Km north of Dammam on the Gulf, and the other in Dammam city. The factory at Minifa is the main centre for collecting fish from the Gulf, and consists of two broken ice plants, with a total capacity of 42 tons, powered by two generators with a capacity of 300 Kmh, and is supplied by 40 trawlers each capable of carrying three tons. In addition,

there are two mother ships[1] with a total capacity of 900 tons.

The other unit at Dammam is for finishing, packing operations and has one soft ice plant, six lakes for cleaning fish, and other machinery. The capital investment of the plant is SR 7,300,000 and about 446 men are employed.[25] The plant produces fish and shrimps, and the total capacity is about 1700 tons a year,[26] the bulk being exported to the Lebanon, Japan and the U.S.

(d) Lotus Foodstuffs Factory

Located at Dammam this factory commenced production in April 1973 and occupies an area of about 6,000 square metres. The raw materials of the plant are sugar, sesame, nuts, starch and perfumery. The present finished products are coffee, turkish delight, Halawa, white Tihaniya, sesame oil. Plans are being made for the production of some types of chocolate in the near future. The capacity of the plant is about 197 tons per year, mostly for local markets, but during 1973 about 8 tons were exported to Bahrain and Abu-Dhabi.[27] The capital investment is SR 222,000 and 16 workers are employed.[28]

(e) Saudi Animal Foodstuffs Plant

Located in Dammam this factory was established in 1965 at the industrial estate; it covers an area of about 27,000 square metres and produces animal fodder. The raw materials of the plant are different types of seed, brown beans and animal concentrates. The daily capacity is 32 metric tons and the company has recently decided to increase its daily production to 100 tons. In 1972 the total production was 8700 tons, worth approximately SR 6,411,900. The output almost all goes to local markets, with just over 10% being exported to Bahrain and Abu-Dhabi. The capital investment is SR 270,000 and will rise to SR 2,500,000 22 men are employed.[29]

(f) Paper Factories

In the Eastern Province there are four factories for the manufacture of paper products, two established in Al-Khobar in 1968; one in Dammam

(the oldest factory in the province) established in 1956; and one in Rihaimah at Ras Tannura, established in 1968. Three of the factories produce paper and paper by-products, rolls and also plastic and nylon bags. The fourth factory produces paper Kleenex. These factories cater almost entirely for the demand of the fertiliser and cement factories for bags. The total capital investment of the factories was approximately SR 1,578,652 and 42 workers are employed.[30] (See Table 6.10.

(g) National Textile Company

Located in Hofuf city at Al-Hasa Oasis, this company was established in 1963 and occupies an area of about 1500 square metres. The raw material used is camel wool, and the annual cloth production of the factory is 175,000 metres of material 75-80 cm wide; the total capacity of the factory is 251,000 metres a year. About 80% of the output goes to local markets, only 20% exported to other Arabian Gulf countries. The type of material produced is a special cloth for making Abah (Mishlah) based on traditional hand skills. Expansion is planned for the near future, to enable the factory to produce various other types of material. The capital investment is SR 1,400,000 and there are about 30 workers in the factory.[31]

(h) Glass Factory

This is situated on the road between Dammam and Dhahran; established in 1969 it started production in April 1973. The factory occupies an area of about 50,000 square metres, and also has a residential site for its employees. The raw materials are almost all locally produced. Various types of bottles are manufactured and the factory also designs and produces different kinds of cooking utensils. The annual production is 10,500 tons and will shortly increase to 18,000 tons. The power consumption of 300,000 Kw monthly, and the factory also used 20 billion units of natural gas per month. The capital investment in this factory is SR 25 million, and 292 workers are employed.[32]

TABLE 6.10
PAPER PRODUCTION FACTORIES IN THE EASTERN PROVINCE

Name of	Location	Type of Product	Capacity a year	Capital (in SR)	No. of Workers	Date
Industrial Processing Centre	Al-Khobar	Kleenex	1,440,000	450,000	12	1968
Paper Products National Company	Dammam	Paper products	876 tons plastic bags, 36m bags, 250 tons envelopes & stationery.	750,000	14	1956
Nylon and Paper Bag Factory	Rihaima	Bags and rolls	65 tons nylon bags 290 tons paper bags	269,652	8	1968
Paper Products	Al-Khobar	Paper bags and derivatives	200 tons paper bags	104,000	8	1968

Source: Ministry of Commerce and Industry

(j) Pipe Coating Factory

Located on the road between Dammam and Al-Khobar near to Dammam port, this factory occupies an area of about 180,000 square feet, and commenced production in 1962, mainly coating oil pipes which are laid under the sea. The size of pipes handled is between 8 to 30 inches, and the factory plant to cater for pipes up to 72 inches. Production is [33] dependent on demand but the total capacity is one million feet a year. About 50.0% of the raw materials are imported, the remainder being obtained locally. The capital investment is 6 million SR, and the [34] number of workers is 190.

(k) Asbestos: Saudi Arabian Company (Amionlit)

This is the second asbestos factory in Saudi Arabia, the first being located in Jeddah. The factory is situated on the road between Dammam and Al-Khobar and was established in 1965, production commencing in 1970. The factory uses locally-produced cement from the cement factory at Hofuf, and about 1500 tons each month are used in the manufacture of asbestos and cement pipes in varying sizes for water and sewage purposes. Annual total production of 5000 tons of asbestos sheets and 26,400 tons of pipes. The factory was designed only a few years ago, mainly to produce for the export market, but its entire production is now being used within Saudi Arabia. Because of the heavy demand for pipes produced in this factory, the total production is booked for six months in advance. The plant has turned out pipes for entire systems in Riyadh and Mecca, and for the 48 Km strip of Gulf coastal townships linked to the new Al-Khobar deslaination plant. The capital investment is SR 4 million, and the plant is staffed by 210 men working [35] for 24 hours around the clock on a three shift basis.

(l) Saudi Cement Company

The output of the three factories in Jeddah, Riyadh and Hofuf accounts for about 50% of the total consumption of Saudi Arabia, and demand is rising rapidly as the construction industry continues to thrive. The factory at Hofuf was established in 1960 and is situated on the road to

Dammam. It is fuelled by natural gas from Shadgum gas plant, and its basic raw material (8 million cubic feet of limestone daily) comes from its own nearby quarry, with clay and gypsum being bought from privately owned quarries nearby. The total capacity is 1400 tons daily, but the production is not sufficient to cater for the demands of the local market in the province, because of the considerable increase in demand.

The cement factory produces three varieties of cement: standard Portland; oil well cement (characterised by its long-setting qualities) - annual production 50,000 tons; and special salt-resistant variety for use near the sea, which was used in building the new desalination plant in Al-Khobar

In 1972 the total cement production of the Hofuf factory was about 401,815 tons, about 78.6% of total capacity, and there was a demand for this cement not only in the local markets but also from the whole of Saudi Arabia. The two factories at Riyadh and Jeddah could not cater for the demand in their areas, and were forced to import a high proportion of their cement. The total production of the three factories in Saudi Arabia recently supplied 50.5% of the total consumption, the rest being imported (See Table 6.11 showing the amount of local production and the amount of cement imported. See also Fig. 6.12). The cement factory at Hofuf ranks second in production to Jeddah and 14.0% for Riyadh. In 1972 the Hofuf factory produced about 44.1% of the total (See Table 6.12 and Fig. 6.13 showing production figures for the three factories).

The capital investment of the cement factory is SR 70 million, and should shortly increase to SR 210 million when the new expansion, which will increase production from 1400 to 2900 tons a day is complete. The new expansion includes the construction of a complete new factory with a production capacity of 1500 tons a day to cater for the demands of the Eastern Province and the Gulf countries. At present the factory employs about 200 men, some of whom live on the private site for factory

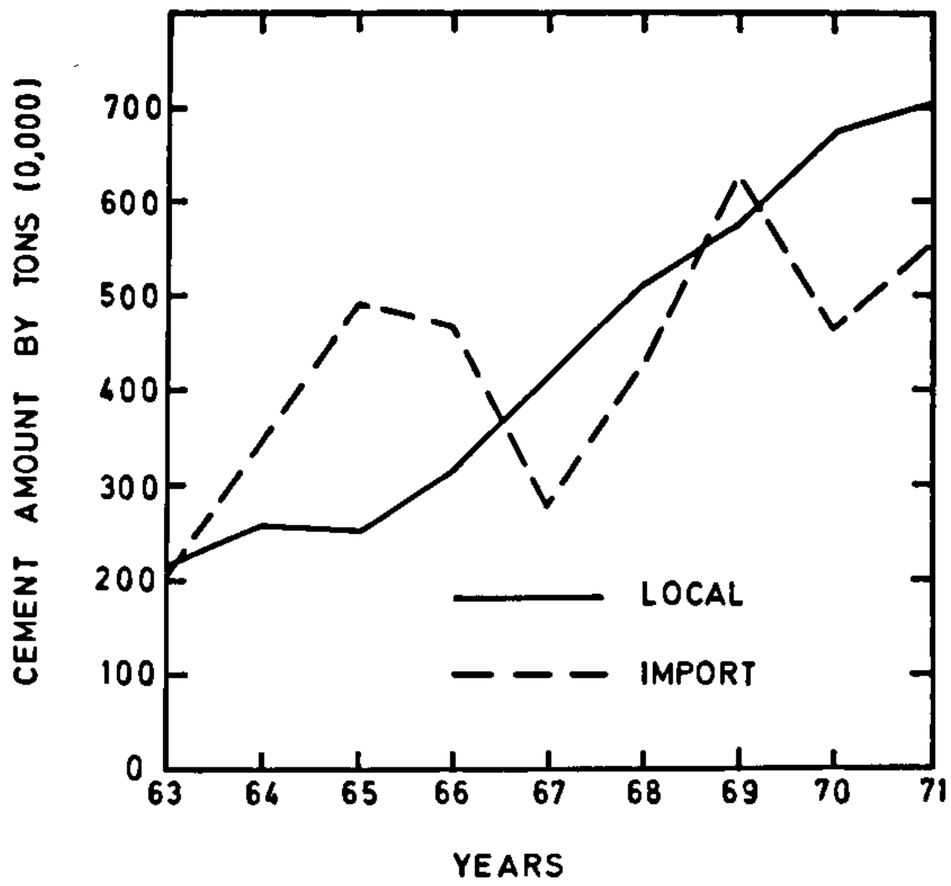
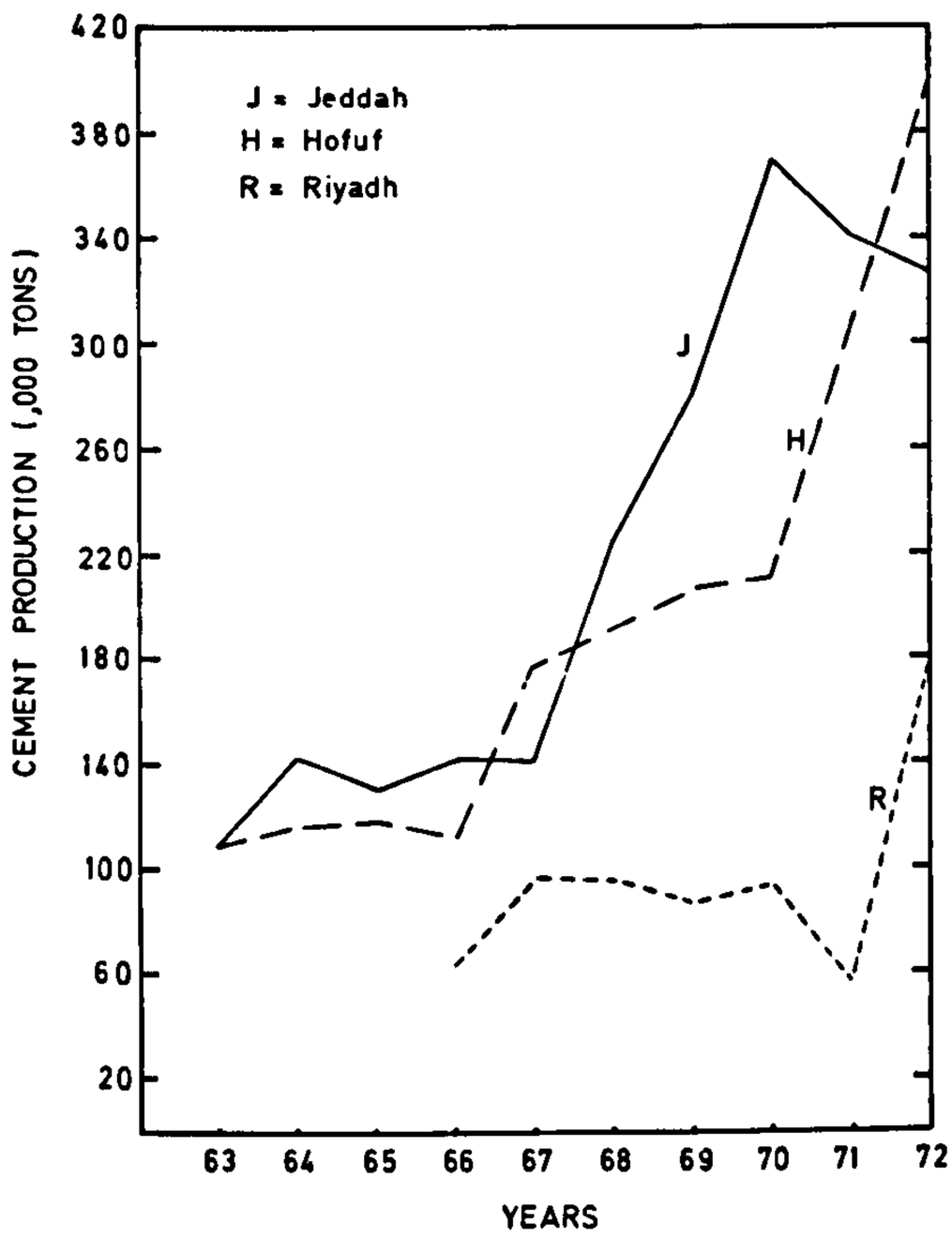


FIG.6.12. Annually amount of local and import cement used in Saudi Arabia by tons (1963-71)



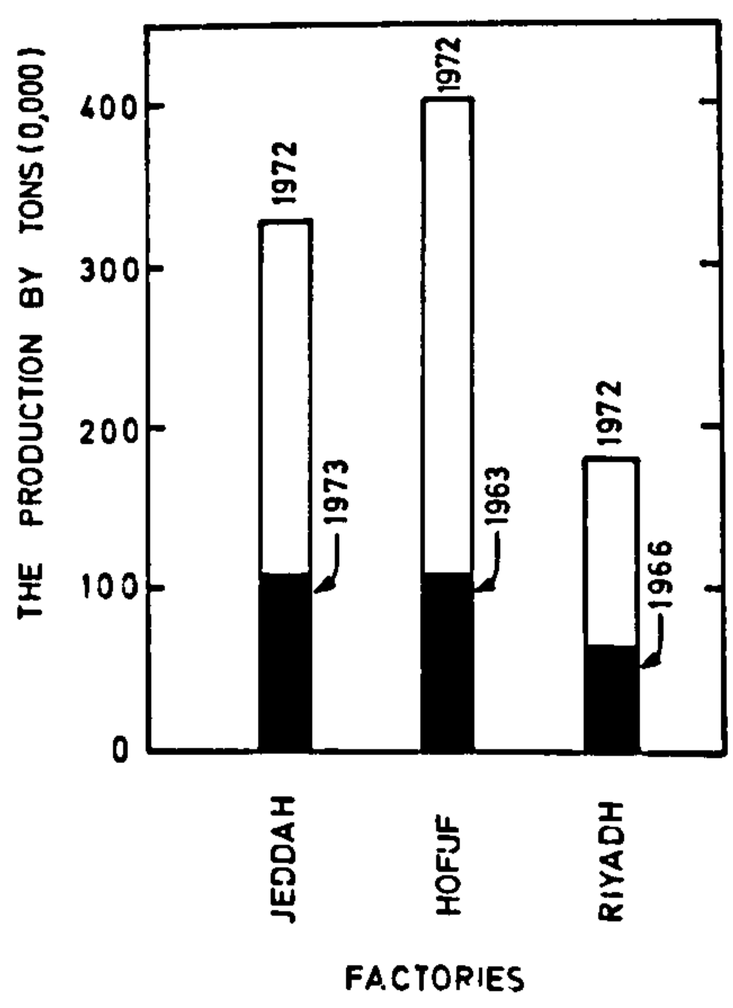


FIG. 6.13. Size of cement production by tons in the three factories of Saudi Arabia (1963-72)

TABLE 6.11
ANNUAL AMOUNT (IN TONS) OF LOCAL & IMPORTED CEMENT IN SAUDI ARABIA

Year	Local	%	Imported	%	Total	%
1963	216,967	51.8	201,524	48.2	418,491	100
1964	258,510	43.2	339,680	56.8	598,190	100
1965	250,242	33.7	491,770	66.3	742,012	100
1966	316,525	40.5	465,114	59.5	781,639	100
1967	415,043	59.8	278,516	40.2	693,559	100
1968	510,813	54.2	431,936	45.8	942,749	100
1969	575,636	48.0	623,306	52.0	1,198,942	100
1970	674,950	59.3	463,801	40.7	1,138,751	100
1971	703,371	56.1	549,876	43.9	1,253,247	100
AVERAGE	435,784	50.5	427,280	49.5	863,064	100

Source: Statistical Year Book 1973

TABLE 6.12
AMOUNT OF CEMENT PRODUCTION (IN TONS)

Year	Jeddah		Hofuf		Riyadh		Total	
	No.	%	No.	%	No.	%	No.	%
1963	108,713	50.1	108,254	49.9	-	-	216,967	100
1964	142,116	55.0	116,394	45.0	-	-	258,510	100
1965	130,760	52.3	119,482	47.7	-	-	250,242	100
1966	140,195	44.3	112,311	35.5	64,019	20.2	316,525	100
1967	140,151	33.8	177,407	42.7	97,485	23.5	415,043	100
1968	224,000	43.9	190,604	37.3	96,209	18.8	510,813	100
1969	280,225	48.7	207,660	36.1	87,751	15.2	575,636	100
1970	370,669	54.9	210,730	31.2	93,551	13.9	674,950	100
1971	341,323	48.5	304,390	443.3	57,658	8.2	703,371	100
1972	327,601	36.0	401,815	44.1	180,959	19.9	910,375	100
AVERAGE	220,575	45.7	194,905	40.3	67,763	14.0	483,243	100

Source: Statistical Year Book 1973

employees, which is equipped with a school, library, recreation area, and swimming pool.[36]

(m) Electricity

The main power stations in the Eastern Province are as listed below:

(i) Dhahran District: this is the largest company, supplying Dammam, Al-Khobar, Al-Thuqbah, Qatif and Syhat.

(ii) Al-Hasa: this power station supplies electricity to Al-Hasa region.

(iii) Rihamah: supplies power for the northern area of the province.

In addition there are three other stations owned by Aramco and situated at the oil towns of Ras Tannura, Dhahran and Abqaiq, and supplying the oil company's employees. The total capacity of Aramco stations is 178 million Kwh. Both Aramco and its domestic stations use natural gas as a fuel.[37] The average power production of the domestic stations is about 125,297 thousand Kwh. In 1972 the figure was about 210,407 thousand Kwh, an increase of 27.8% over the 1971 figure, and the average annual increase is about 17.6% (See Table 6.13 showing total prodiction, and see also Fig. 6.14).

TABLE 6.13
ANNUAL TOTAL PRODUCTION OF POWER

Year	Production	% Increase
1966	64700	-
1967	80239	15.2
1968	97243	21.2
1969	123576	27.1
1970	131311	6.3
1971	164605	25.4
1972	210407	27.8

Source: Ministry of Finance (Central Department of Statistics)

Electrical power production in the Eastern Province is approximately 19.7% of the average total in the main regions in Saudi Arabia. About 86.6% of the Eastern Province's power was produced at Dhahran district

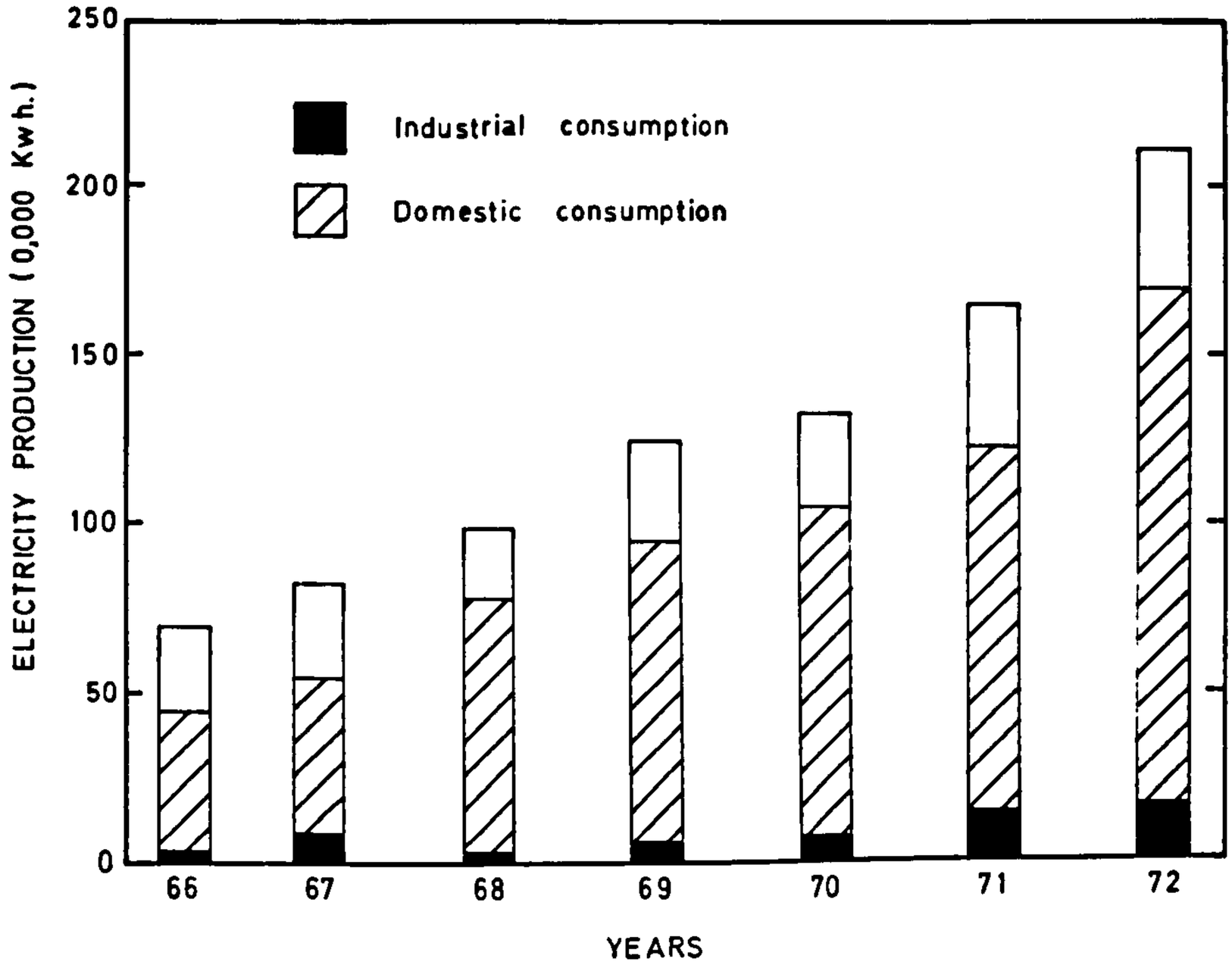


FIG. 6.14 Annually consumption of domestic and industry and the total of electricity production (1966 - 1972)

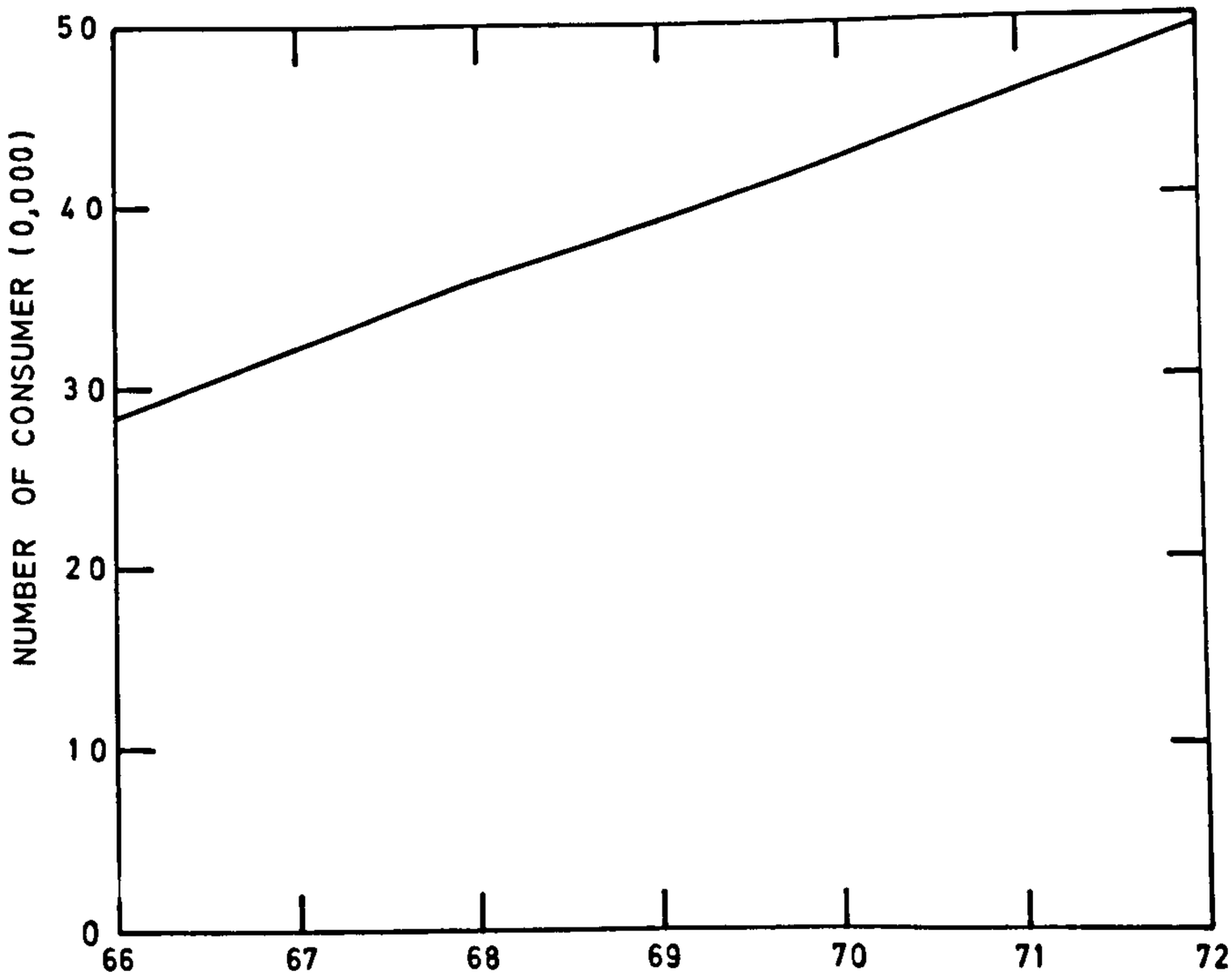


FIG. 6.15 Growth of consumers (numbers) of electricity (1966 - 1972)

power station, 10.7% coming from Al-Hasa, and the remaining 2.7% from Rihaima. Approximately 79.4% of the electricity goes for sale. A very small amount (about 5.2%) is used by the industrial sector as energy and the bulk (about 74.2%) being used for domestic consumption (See Table 6.14 showing the consumption of electricity in industrial and domestic sectors).

TABLE 6.14
INDUSTRIAL AND DOMESTIC CONSUMPTION OF ELECTRICITY BY O.OOO (EASTERN PROVINCE)

Year	Industry	%	Domestic	%	Total	% of Total Production
1966	2213	312	44087	63.3	46300	66.5
1967	8466	10.6	54226	67.6	62692	78.2
1968	2417	2.3	75339	77.5	77756	80.0
1969	5263	4.3	94094	76.1	99357	90.4
1970	7396	5.6	104827	79.8	112223	85.4
1971	8924	5.4	122816	74.4	131740	80.0
1972	10404	4.9	169126	80.0	179530	85.3

Source: Ministry of Finance, Central Department of Statistics

The use of electric power in the industrial sector has not been characterised by rapid growth from year to year, since most of the industries in the Eastern Province use natural gas as a fuel, whereas the consumption of electricity for domestic purposes shows a steady and rapid growth, from 63.3% in 1966 to 80.4% of the total produced for 1972 (See Fig. 6.15showing the growth in consumption). The number of consumers also rose from 28,643 in 1966 to 48,650 in 1972, and the number of Kwh per consumer has risen from 1616 in 1966 to 3690 in 1972 (see Table 6.15 showing the growth in number of consumers and the rise in Kwh per consumer).

It has not been possible to use data on energy consumption to analyse industrial development because of the reliance of most manufacturing firms on gas. The piped distribution of natural gas to industry is not very extensive and no figures for this have been obtainable. The great majority of small concerns, together with other users, rely on

container gas. At the consumption end hardly any users keep records of purchases while at the production end those data which are available are only approximate aggregates which cannot be analysed.

TABLE 6.15
NUMBER OF CONSUMERS & NUMBER OF Kwh PER CONSUMER (EASTERN PROVINCE)

Year	Number of Consumers	KwH per Consumer
1966	28643	1616
1967	32322	1940
1968	35861	2168
1969	38932	2559
1970	42403	2647
1971	45904	2870
1972	48650	3690

Source: Ministry of Defence, Central Dept of Statistics

The main consumers of electricity in Dhahran (about 48.0%) are the residents of the major cities, the remainder being used by business premises, schools, hospitals, hotels, offices and for street lighting, industrial use, public utilities and others. (See Table 6.16 showing the distribution of electricity by Dhahran District Company in the major cities.)

TABLE 6.16
DISTRIBUTION OF ELECTRICITY BY DHAHRAN DISTRICT COMPANY (IN 0.000)

Consumer	1970		1971		1973	
	No.	%	No.	%	No.	%
Domestic Consumers	44931	48.7	54202	48.6	76493	48.6
Commerce	9309	9.7	10613	9.5	14583	9.3
Schools	4803	5.0	6100	5.5	11465	7.3
Hotels/Hospitals	4209	4.4	4384	3.9	5459	3.5
Offices	15027	15.6	17175	15.4	20084	12.8
Factories	7271	7.6	7234	6.5	9977	6.3
Companies	3409	3.5	3953	3.5	5712	3.6
Public Utilities	4288	4.5	4490	4.0	5064	3.2
Streets	2361	2.5	2702	2.4	3023	1.9
Others	505	0.5	758	2.7	5602	3.6
TOTALS	96113	100	111611	100	157462	100

Source: Ministry of Finance, Central Department of Statistics

4. New Projects in Industry

Increased industrial activity, accompanied by the growth in demand in the Eastern Province should show a faster growth rate in more heavily industrialised regions. Many new factories are now under construction, and a feasibility study is being undertaken for an aluminium plant with a production capacity of 140,000 tons a year. In addition a preliminary agreement has already been signed between Petromin, two Japanese companies (Nippon Steel and Nippon Kokan) and US firm Marconi Corporation, to build a steel mill near the port of Al-Jubail, at a cost of approximately SR 2250 million (500 million US dollars). This mill will have an initial capacity of one million tons a year, rising by increments to five million tons a year.[38] Other plans are also under consideration in the current Development Plan discussions.

5. Workshops and Repair Shops

These entail a smaller capital investment than the factories, and do not normally use a large volume of raw materials. There are 240 workshops and repair shops in the major cities, and about 63.7% of these are situated in Dammam and Al-Khobar, the remaining 36.3% being in Hofuf and Qatif. In addition there are 68 very small workshops and repair shops. The industrial classification of the more important establishments is as follows: 36 were covered by ISIC 251 - sawmills, planing and other wood mills; 38 were covered by ISIC 350 - manufacturers of metal products, with the exception of machinery and transport equipment; 20 were classified as ISIC 360 - manufacturing machinery other than electrical machinery; 68 were covered by ISIC 381 - maintenance and repair shops; and 78 were covered by ISIC 384 - for the repair of motor vehicles (see Table 6.17 showing the distribution of workshops and repair shops in the major cities.)

The types of workshops and repair shops under classification ISIC 251 were generally carpenters shops, those under ISIC 350 were

TABLE 6.17

DISTRIBUTION OF WORKSHOPS & REPAIR SHOPS BY LOCATION & ISIC CLASSIFICATION

ISIC	Classification of Workshops & Repair Shops	Dammam	Al-Khobar	Hofuf	Qatif	Total	%
251	Sawmills, planing & other wood mills	11	9	14	2	36	15.0
350	Manufacture of metal products except machinery & transport equipment.	17	13	7	1	38	15.8
360	Manufacture of machinery except electrical machinery	7	6	6	1	20	8.4
381	Maintenance & repair	17	23	20	8	68	28.3
384	Repair of motor vehicles	28	22	28	-	78	32.8
	TOTALS	80	73	75	12	240	100
	Percentage	33.3	30.4	31.3	5.0	100	

Source: Aramco (Survey of Local Business Establishments)
Fieldwork 1973

blacksmiths shops, dealing with door and window frames, and water tanks; those under ISIC 360 were lathe works; those under ISIC 381 were for the repair and maintenance of refrigerators, washing machines, radios and television sets, and the remainder were car repair shops.[39]

6. The Structure of Industry

According to the General Directory of Industrial and Electricity, and the Industrial Studies and Development Centre in Riyadh, in 1970 there were 70 registered and recorded factories (excluding the oil refinery at Ras Tannura) employing nearly 4,299 workers and with a total capital investment of SR 417,972,316 (about £49,173,214). (See Table 6.18). The average number of workers per factory was 61, and the average amount of capital investment per factory was approximately SR 5,971,033. Those factories employing more than five persons use power-driven machinery or gas, and the capital investment is not less than SR 100,000. The most important industries in the Eastern Province are chemical and petrochemical and cement products, and together they account for 20.0% of the total factories in the province, employing 34.6% of the total workers, and having a 53.7% share of the total capital investment. The manufacturers of food, canned goods, dairy products and sweets together accounted for 11.4% of the total number of factories and about 17.0% of the total work force. The soft drinks, ice and water manufacturers accounted for 12.9% of the factories and 14.7% of the work force. Paper, printing, textiles and clothing manufacturers accounted for 22.9% of the factories, and employed 7.7% of the work force. The manufacturers of bricks, tiles and metal products occupied 24.3% of the factories, and employed 17.7% of the total number of workers. The remainder were fabrics, glass, turnery, carpentry, ship repair and other processing industries, and together they made up approximately 8.6% of the factories, employing 8.4% of the workers.

TABLE 6.18
INDUSTRIAL STRUCTURE UP TO 1972 IN THE EASTERN PROVINCE

ISIC	Factories	Employees	Workers per Factory	Capital Investment	Average Capital per Factory
202	1	40	40	746,300	746,300
203	1	126	126	771,000	711,000
204	1	446	446	7,300,000	7,300,000
208	1	16	16	222,000	222,000
209	4	101	25	1,512,900	378,225
214	7	507	72	1,854,576	264,965
231	1	30	30	1,400,000	1,400,000
243	1	36	36	500,000	500,000
251	2	14	7	362,573	181,287
260	1	292	292	2,500,000	2,500,000
272	4	42	11	1,578,652	394,663
280	10	222	22	2,649,000	264,900
311	13	1,287	99	154,748,880	1,190,376
321	The oil refinery at Ras Tannura			.....	.....
331	13	690	53	14,570,491	1,120,807
334	1	200	200	70,000,000	70,000,000
350	4	71	18	1,280,944	322,236
381	1	17	17	125,000	125,000
399	2	38	19	249,000	124,500
521	2	124	62	116,400,000	58,200,000
TOTALS	70	4,299	61	417,972,316	5,971,033

Source: Ministry of Commerce and Industry
Industrial Studies and Development Centre.

The further analysis of industries in the Eastern Province will indicate the nature of industries, size of employment, system of work organisation and capital investment.

(a) Employment Size

The 70 firms mentioned in this study are the major and most important in the Eastern Province according to the particular industry and its employment size (See Table 6.19) 14.3% of the factories employ less than 10 workers each, 60.0% employ between 10 and 29 workers, 7.1% between 50 and 79 workers and the remaining 18.6% have over 100 workers, the greatest number, 523, being employed in the fertiliser factory at Dammam. The high proportion of small firms reflects the true position of industry in the Eastern Province. There are only six firms employing over 100 employees, only 8.6% of the total number of factories employ over 200 workers, and only one has a work force of over 500.

This size structure is characteristic of situations to be found in many developing countries at a similar stage, for instance Egypt up to 1957.[40]

(b) System of Work Organisation

The factories in the Eastern Province are divided into three main types as follows:

(i) First Type consists of small manufacturers and work shops. They provide a personal service, often to the customer's own specifications and requirements. Most of these small industrial units are located within the major cities or towns and in or near the city centres to facilitate easy access for their customers. They include the makers of bricks, tiles, ice and soft drinks, as well as turnery, carpentry and metal workshops. This type of concern is usually owned by one or two people and is essentially little more, typologically, than that to be found in traditional urban suks.

TABLE 6.19

EMPLOYMENT SIZE IN EASTERN PROVINCE FACTORIES UP TO 1972

ISIC	Less than 10	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100+	
202					1							1
203											1	1
204											1	1
208		1										1
209			4									4
214		1	2	2							2	7
231				1								1
243				1								1
251	1	1										2
260											1	1
272	2	2										2
280	1	3	3	3								10
311	2	2	3			1				1	4	13
321												-
331	3	2	2	1	1	1		1			2	13
334											1	1
350	1	2	1					1				4
381		1										1
399		1	1									2
521			1								1	2
TOTALS	10	16	17	8	2	2	-		-	1	13	70

Source: Ministry of Commerce and Industry
Industrial Studies and Development Centre

(ii) Second Type consist mainly of medium-sized factories producing specified goods for local consumption. They include the manufacture of paper, printing, sweets, dairy produce and gas, which are everyday needs in the province. Normally this type of factory is situated near the major cities or on the industrial estates.

This type of establishments, together with many of the first type, are essentially concerned with local consumer demand for goods and services. There is a close analogy in Kuwait where for similar reasons personal incomes have risen very rapidly during the last twenty years and have not only forced up imports but also created a large demand for local products. In the Eastern Province this surge is seen most strongly in the newer urban centres.

(iii) Third Type is made up of the main factories producing goods for local or export markets. These firms are mainly large ones, employing many workers, and play a very active part in the economy of the province. They comprise the manufacturers of fertilisers, fish and shrimps, textiles, glass, cement and sulphur, and the date-packing factory, and also some of the chemical products. This type is located on the roads between the major cities, or on the industrial estates. They are usually owned by joint stock companies and almost always some of the stock is government owned.

(c) Capital Investment

About 70% of these firms were founded with a capital investment of less than SR 1 million, and many were founded by individuals encouraged by the success of others in running factories. The main source of their finances for investment and working capital was their own private savings or personal loans from banks or business people. They usually began their factory with this small capital investment, running costs being provided from their profits. The factories were expanded as and when the owners could raise further capital.

The 1970 survey of industrial establishments in the Eastern Province by the Industrial Studies and Development Centre in Riyadh reported that 34.1% of the capital investment was from private sources, 65.2% from local sources and 0.7% from foreign sources.[41] About 22.9% of the factories were established with a working capital of between 1 and 10 million SR, and had their finance provided by individuals or by a company of limited shareholders. The remaining 7.1% of these factories were started with a capital investment of between 25 and 115 million SR, the main sources of their finance being government and, to a lesser extent, private investment. (See Table 6.20 showing the size of factory and initial capital investment.)[42]

A high proportion of the total capital investment was in the chemical and petrochemical industry (53.8%); 27.8% in the cement firms, and the remainder being invested in water supply and the remaining factories in the province. (See Table 6.21 showing the percentage of factories and their capital investment.)

7. Land and Floor Area per Employee

The amount of land and floor space per employee in these factories is varied, as 9.1% of the factories have from less than 10 to 19 square metres of land area per employee, with the same size of area by floor area for 18.7% of the total factories. 31.8% of factories had work areas ranging between 20 and 49 square metres per person; about 13.6% of the factories had a work area per person from 50 to 99 square metres of land and 18.8% of the factories had the same amount of floor area per person - the remaining 45.4% of factories had a land area of approximately 100 square metres per person. Only 31.2% had over 100 square metres per person. (See Table 6.22).

8. The Spatial Pattern of Industries

In a region in which industrialisation has been recent as well as rapid, it could have been expected that a planning approach through land use zoning might have been adopted. That is, manufacturing industry

TABLE 6.20
SIZE OF FACTORIES BY CAPITAL INVESTMENT UP TO 1972 (0000 SR)

ISIC	Under One Million	1000-4999	5000 9999	10000-14999	15000-19999	20000-21999	25000 and over	Total Number of Factories
202	1							1
203	1							1
204			1					1
208	1							1
209	4							4
214	3	4						7
231		1						1
243	1							1
251	2							2
260							1	1
272	4							4
280	10							10
311	6	2	3				2	13
321	The oil refinery at Ras Tannura							
331	9	3	1					13
334							1	1
350	4							4
381	1							1
399	2							2
521		1					1	2
TOTAL	49	11	5	-	-	-	5	70

Source: Ministry of Commerce and Industry

TABLE 6.21
PERCENTAGE OF FACTORIES AND THEIR CAPITAL UP TO 1972

ISIC	Percentage of Capital Investment	Percentage of Factories
202	0.2	1.4
203	0.2	1.4
204	1.7	1.4
208	0.1	1.4
209	0.4	5.7
214	4.4	10.0
231	0.3	1.4
243	0.1	1.4
251	0.1	2.9
260	6.0	1.4
272	0.4	5.7
280	0.6	14.3
311	37.0	18.6
321	-	-
331	3.5	18.6
334	16.8	1.4
350	0.3	5.7
381	0.03	1.4
399	0.1	2.9
521	27.8	2.9
TOTALS	100	100

Source: Ministry of Commerce and Industry

TABLE 6.22
DISTRIBUTION OF FACTORIES BY LAND AND FLOOR AREA
BY PERCENTAGE PER EMPLOYEE (EASTERN PROVINCE)

Area by Sq.m.	% for Land Area	% for Floor Area
Less than 10	4.6	-
10-19	4.5	18.7
20-49	31.8	31.3
50-99	13.6	18.8
100 +	45.5	31.2

Source: Industrial Studies and Development Centre (Survey of 1970).

could have been segregated from residential areas and commercial business districts. In fact, as is shown in the case-studies examined in Chapter 8, this has not happened. In this preliminary overview, two points only need be made. First, some industries and services e.g. printing, turnery, carpentry, blacksmiths shops, foodstuffs, clothing, ice, soft drinks, bricks and tile manufacturers have 62.9% of the establishments located within the city centre at Dammam, Al-Khobar and Hofuf. (See Table 8.15) These are almost invariably small scale in employment and floor area and are craft industries often only utilising family labour. They all have their roots in the bazaar or suk practice of combining workshop, retail outlet and sometimes living quarters in one building and their commercial proximity to the market in the town centres is the decisive locating factor. These industries have tended to separate, to some extent, the functions of manufacture and sale, but they remain centrally located.

On the other hand these industries which from their inception had a smaller proportion of direct sales to individual consumers employed more wage paid labour and demanded larger working areas are located elsewhere. The manufacturers of dairy produce, distillation, some of the chemical and petrochemical plants, furniture, cement and paper (together accounting for 25.7%) can be found on the main roads between the major cities. The remaining 11.4% of the factories were sited on the industrial estate in Dammam, e.g. the manufacturers of foodstuffs, fish and shrimps, sweets and some of the chemical firms. Some aspects of industrial location are further examined in Chapter 9.

As far as accommodation is concerned, the factories mainly occupy the entire site on one floor with an area of between 100 and 10,000 square metres, the land area being from 500 to 10,000 square metres. About 13.0% of the factories have a floor area or built-up area between 500 and 10,000 square metres and own an area of land in excess of 10,000 square metres.[43] (See Table 6.23 showing the distribution of factories by area of land occupied).

TABLE 6.23

BIVARIATE DISTRIBUTION OF FACTORIES BY PERCENTAGE OF LAND AND FLOOR AREAS (EASTERN PROVINCE)

Floor Area	Less than 500	501-1000	1001-2000	2001-5000	5001-10,000	Over 10,000	Unspecified	Total
Less 100	-	-	-	-	-	-	-	
101-200	-	-	4.3	-	-	-	-	4.3
201-500	-	-	-	-	-	-	-	
501-1000	-	8.7	-	-	-	-	-	8.7
1000-2000	-	-	13.0	8.7	-	4.4	-	26.1
2001-5000	-	-	-	8.7	4.3	4.4	-	17.4
5001-10,000	-	-	-	-	-	13.0	-	13.0
Unspecified	13.0	-	4.4	4.3	4.4	-	4.4	30.5
TOTALS	13.0	8.7	21.7	21.7	8.7	21.8	4.4	100

Source: Industrial Studies and Development Centre.

Conclusions

These industries play an important role in the economic development of the Eastern Province, and Saudi Arabia, as they create additional employment opportunities in rural and urban centres as well as the opportunities of employment in the oil industry. They contribute substantially to the industrial development of the region with all that this implies for concentration of employment, residence etc. The small firms or workshops are closely associated with central town planning problems, as they are commonly found within the city, as in Dammam, where they are concentrated in the south-east near the centre of the city, and Al-Khobar, where they are in the east, close to the sea and in the west on the perimeter of the city centre. In the east of Al-Khobar we find the printing works and garages, and some brick and tile plants, and this area could be developed as a beautiful coastal area of the city. In Hofuf these small firms are concentrated in the north of the city on both sides of the main street, running south to the city centre. The reasons for these particular locations are as follows:

In Dammam and Al-Khobar the workshops were originally set up in the south-east, before Dammam had developed and expanded its built-up

area, and also because this side of the city is near the sea and the port of Dammam.

In Hofuf they were originally sited in the north, on the road to Dammam, Dhahran and Riyadh, near to the old town of Hofuf, but the newly built-up area has joined the site to the city. As the new urban expansion of Dammam and Al-Khobar includes more new satellite areas, plans are being made to clear the slums in the city centres and relieve the congestion of workshops and therefore industrial re-location will be necessary. It is therefore essential to study the infrastructure of these factories and their intra-urban location factors in order to formulate a rational relocation policy. In Dammam and Al-Khobar there are many areas like this near the city centre, with slum areas being found within the residential area, particularly those housing the work shops, garages and carpenters and blacksmiths shops. In the main cities locational motivation is influenced mainly by keeping these small industries within easy access of the consumer, but the initial deciding factors are availability of a site at a suitable rent. In addition the behavioural concepts of individual firms are, in many cases, important factors underlying locational decisions, as individual owners prefer to set up their business as near to their homes as possible, and where their workers will have the minimum possible travelling distance. Some factories which are being built some distance from the cities are providing low rent housing with all necessary amenities for their employees; these firms in the main are the manufacturers of cement, paper, fish processing and other factory type as distinct from workshop industries.

However, the development of non oil industries are very recent in the eastern province. Many of them were established to cover the demands of other industries such as paper production factories mainly to supply cement and fertiliser plants with paper sacks. Also the pipe coating factory was established for coating the oil pipes for the oil companies

in the province. Other factories are established mainly for export production such as fertilisers, asbestos, and shrimps. Even though the country needs to meet first internal demand before export production; the present industrial output is insufficient for the local market even in the eastern province such as processed dairy goods, ice packed dates, confectionery, paper, textiles, fish and cement. All need far more development and expansion in production. For instance the textile factory in Hofuf is producing a material for the traditional clothes (uabah and mishlah), but cannot meet in volume existing local demand let alone demand for other cloths; there are many industrial goods of high order consumption in the local markets which do not need much raw materials or capital, such as toys, washing powder (only now produced in a factory at Jeddah), sea-shells industrial products such as buttons, tomato puree and others. One problem facing any expansion of industries is the labour shortage resulting from the small size of the population, a certain lack of training and the wide opportunities open in trade and commerce. With care, studies could choose the industries which need small numbers of skilled and other employees, and the skilled employees could be imported from abroad. Other industries already established in the province have already been faced by such problems. Above all, the industries in the eastern province can utilise natural gas as a very cheap and plentiful fuel, which could make the establishment of industries easier than in any other area of Saudi Arabia.

In the meantime most of the people of the eastern province prefer to invest money in housing, building, buying of lands and retail development rather than in the industrial sectors, where there is considerable uncertainty as to rate of return on money invested. As the result of government policy one new industrial estate equipped with services has already been established between Dammam and Al-Khobar and by early 1975 all the factory sites had been allocated. Other similar installations

could encourage factory development in the region. The planned development of Al-Jubail by large scale industry could help more development in the Eastern Province industries and could combat the rising number of people prefering clerical to production jobs and who could be attracted to the industrial sector by high wages. There remains the problem outside the scope of the present thesis, but clearly identified in the Kingdom's Second Development Plan, of manpower shortage given the rapidity of planned developments. Some of the phenomena such as migration, occupational change and decline of traditional sectors such as agriculture, noted in this thesis will become even more important if industrialisation continues even more rapidly than it already has.

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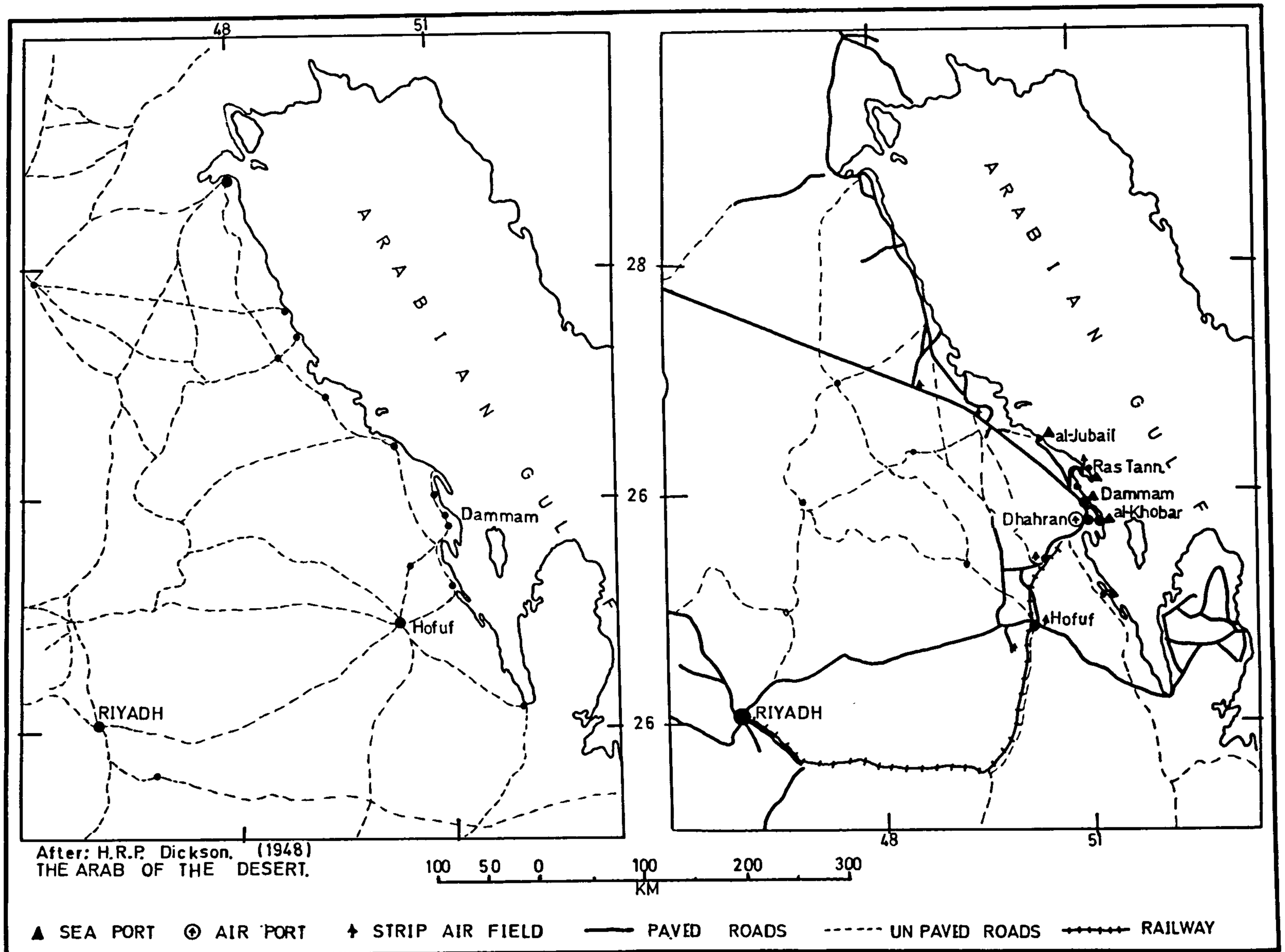
CHAPTER SEVEN

TRANSPORT AND COMMUNICATIONS

Continuing the regional view we now turn to transport which is extremely important in the Eastern Province, and in which enormous developments have taken place during the last twenty years, developments which involve social economic and spatial aspects of settlement. The historical background of transport in the province dates back many hundred years, when the Eastern Province was the connecting point between countries in Eastern Asia such as India, China, Persia, and the Arabian Gulf countries along with other parts of Arabia such as Najid, Hijaz and Yemen. All commercial and other businesses were centred on Hofuf in Al-Hasa Oasis, and this city became of major importance in the region. At that time, the main port was Al-Uqair situated on the Arabian Gulf, about 75Km from Hofuf (see Fig.7.1). The ancient method of travel was mainly by camel caravan and by donkey, and Al-Hasa became famous for its donkeys. Recent economic and social developments have brought many changes in the transport system, and gradually the old methods are being replaced entirely, and the more northerly town of Dammam has replaced Hofuf in importance with regard to transport.

Cars and trains have replaced the camel, and since the discovery of oil in the region, increased mobility as well as improvements in the standard of living have all been factors which have increased the number of motor vehicles. In addition the port of Dammam and the international airport at Dhahran are also extremely important in determining the traffic flow within the region and contribute enormously to the commercial and industrial activities in the province and its cities, with the import and export of goods and the movement of people. We can therefore identify three categories of transport - air, rail and road and sea, and each will be dealt with separately.



OLD SYSTEM OF ROUTES (Caravans) 1946 NEW SYSTEM OF COMMUNICATIONS (1973)

FIG. 7.1 OLD & NEW SYSTEM OF TRANSPORT IN THE EASTERN PROVINCE.

A. Air Transport

The international airport of Dhahran and other airfields, such as Hofuf airport, are government owned; the airport at Abqaiq is owned by Aramco, along with several small strip airfields. Development and improvements to air transport began in 1964, with the construction of the new international airport at Dhahran. Prior to this, Hofuf airfield, now used as a private airfield, was the main airfield for the Eastern Province. The airport at Dhahran increased the importance of the province as it linked with most major cities both in Saudi Arabia and the rest of the world. This airport was established in Dhahran to serve the main business areas of Dammam, Al-Khobar and Dhahran, and is one of the largest and most important airports in Saudi Arabia, the others being Jeddah and Riyadh.

(a) Types of Aircraft

The Saudi Arabian Airlines (Saudia) have four types of aircraft operating from Dhahran - DC9, Boeing 720, 707 and 737, on both local and overseas flights, with an average annual number of flights per craft of about 130. There are also many foreign aircraft landing in Dhahran.

(b) Passengers and Flights

The average number of flights per month is approximately 500, 50% or more by foreign airlines. The average number of passengers arriving in Dhahran by Saudi airlines was about 6,000 a month in 1972, almost all on local flights. The foreign airlines handle about 8,000 passengers a month, almost all on overseas flights. The number of passengers departing by Saudi airlines was 5,761 a month, and by foreign airlines the figure was 7,876 a month (See Table 7.1 showing number of flights and passengers carried.

In 1972 Dhahran airport handled about 12.5% of all incoming passengers to all Saudi airports and about 15.3% of the total departing passengers.

TABLE 7.1
NUMBER OF PASSENGERS AND FLIGHTS (1968-72)

	No. of Flights	Number of Passengers		No. of Flights	Number of Passengers	
		Arrivals	Departures		Arrivals	Departures
1968	3643	42775	45408	5550	84324	79497
1969	2886	50510	49607	3233	58101	54782
1970	2746	53380	53681	3134	62241	37356
1971	2297	53281	53185	2926	57470	58669
1972	2413	74481	69128	2934	94646	91512

Source: Ministry of Finance, Central Department of Statistics

(c) Cargo

The monthly average amount of freight received in Dhahran airport is approximately 548 tons; an average of 9 tons of mail is also carried each month. The average amount of freight carried from Dhahran airport is 110 tons, along with 12 tons of outgoing mail (See Table 7.2 showing freight and mail tonnages moved from Dhahran airport).

TABLE 7.2
FREIGHT & MAIL (IN TONS) MOVED THROUGH DHAHRAN AIRPORT

	Saudi Airlines				Foreign Airlines			
	Freight		Mail		Freight		Mail	
	Arrive	Depart	Arrive	Depart	Arrive	Depart	Arrive	Depart
1968	248.7	411.6	137.8	196.1	1937.8	697.5	139.0	51.6
1969	319.2	472.4	34.0	100.0	2092.8	472.7	167.7	39.1
1970	373.3	520.3	42.9	112.6	2157.9	495.0	80.9	41.2
1971	505.0	588.0	62.0	109.0	2488.0	416.0	55.0	24.0
1972	1045.0	716.0	70.0	127.0	5538.0	530.0	36.0	14.0

Source: Ministry of Finance, Central Department of Statistics

About 11.5% of the freight and 41.8% of the mail arriving at Dhahran airport was conveyed by Saudi lines, the remainder being carried on foreign airlines. These percentages reflect the growth of the business sector in the province, especially with regard to overseas countries. Foreign airlines are not allowed to work locally within Saudi Arabia, and the amount of mail and freight carried by the overseas airlines is evidence of the Eastern Province's good trade relations with overseas countries.

B. Road and Rail Transport

(1) Rail

The length of railway line of the Saudi Arabian government railroad is 566.5Km running between Dammam, Dhahran, Abqaiq, Hofuf, Haradh, and Riyadh. This line is single track of the standard gauge (4'8",1/2) and the rail used is mostly 80 lbs per yard. In addition there are 59Km of branch lines including the 17.3Km line linking Dammam city with the sea port. A daily round trip is operated on this line for passengers, except on Fridays, between Dammam and Riyadh, via the cities of the province. The train travels at a maximum speed of 100km where the track is straight slowing to 60Km where the track curves. There is a similar service for freight, which only operates on alternate weekdays.[1] The rolling stock of the railroad consisted (in 1970-71) of 24 locomotives, 867 freight cars of varying types, 17 passenger cars, 10 refrigerated cars, 28 pieces of assorted equipment, including lifts.[2]

(a) Intensity of Railroad Activity

The value of the railroad as a method of transport lies in its benefit to the human activities of the province, and this is measured by the number of passengers and amount of freight carried.

(b) Freight Movement

In 1972 freight movement was much greater than in any previous year. (See Table 7.3). The increase or decrease of freight movement during the last ten years was not consistent, yet the overall increase in 1972 was 67.9% greater than the 1963 figure. Factors determining the level of railway freight movement are as follows:-

(i) The requirements of the industrial and commercial sectors.

(ii) The density of population and their consumption of a wide variety of goods.

(iii) Type of agricultural activity, particularly in the Oasis of Al-Hasa.

TABLE 7.3
FREIGHT MOVEMENT OF THE S.A.G.R. IN 1963-72

Year	Tonnage Carried (000s)	Tons/Kilometres (millions)
1963	633	77.0
1964	845	64.4
1965	850	55.8
1966	809	52.1
1967	672	34.3
1968	862	45.7
1969	941	45.0
1970	733	34.0
1971	949	39.0
1972	1063	68.4

Source: Ministry of Finance, Central Department of Statistics

The distribution of freight movement in 1972 between railway stations (as shown in Table 7.4) indicates that the highest proportion is carried between Dammam port and Dammam city, with the exception of Dammam freighthouse, where goods are distributed to other areas of the province.

(c) Passenger Movement

The trend figures for the transport of passengers correspond to those for freight movement. In 1972, 133,000 passengers were carried an increase of 111.0% over the 1963 figures (See Table 7.5)

TABLE 7.5
PASSENGER MOVEMENT OF S.A.G.R. (1963-72)

Year	Passengers Carried (000s)	Passenger/Kilometres (millions)
1963	63	24.0
1964	75	27.5
1965	89	31.9
1966	96	33.9
1967	97	37.4
1968	116	59.7
1969	115	43.0
1970	117	38.8
1971	114	41.8
1972	133	48.3

Source: Ministry of Finance, Central Department of Statistics

TABLE 7.4

DISTRIBUTION OF FREIGHT BY RAIL IN 1972

To	Dammam Port	Dammam Freight	Dammam City	Dhahran	Abqaiq	Al-Jedaidah	Hofuf	Ain-Hadrah	Al-Kharje	Riyadh	Total
From											
Dammam Port	3636	441906	165104	117923	28564	135	79715	206	4076	20976	862241
Dammam Freight	12140	-	222	3288	1545	2	45	210	314	1321	19087
Dammam City	1560	-	-	-	1	-	31	287	5	287	2171
Dhahran	2091	256	90	-	6453	-	16223	5	5236	720	31084
Abqaiq	-	-	-	675	-	-	6370	1	-	-	7046
Al-Judaidah	-	-	90550	39200	900	-	225	101	-	-	130976
Hofuf	2970	135	3	453	1308	-	-	1500	4	57	6430
Ain Haradh	-	501	27	-	-	-	61	-	1	70	660
Al-Kharj	240	-	3	-	-	-	-	12	115	62	432
Riyadh	-	90	610	45	1	-	48	2376	-	-	3170
TOTALS	22637	442888	256609	161584	38782	137	102718	4698	9751	23493	1053297

Source: Ministry of Finance, Central Department of Statistics

Less passengers are carried by rail than by road.* The daily average number of passengers travelling by rail was approximately 364, while the passengers carried daily on public vehicles is approximately 1000. Personal fieldwork showed the following possible reasons for this disparity.

(i) Trains make only one round trip per day, leaving Riyadh and Dammam in the morning and arriving during the afternoon, while passengers travelling by other means can choose a more convenient time for their journey.

(ii) Trains stop at a minimum of four stations on the journey between Dammam and Riyadh, and take about seven hours, as opposed to five hours by taxi, as the taxi only makes one stop and is cheaper by 30% than the cost of the train.

(ii) The railway stations at Hofuf and Riyadh are outside the city, and passengers travelling by rail must also use hired cars or taxis to take them to the station, thus increasing the cost of their journey.

Many factors influence the intensity of passenger movement on the railway, and some are outlined below:-

(i) Density of population in areas served by the train - in general, population density is low in the Eastern Province outside the urban centres.

(ii) The number of services operating in urban areas, for all types of travel, including journeys to and from work for those who must travel to find employment, eg people from Al-Hasa Oasis working in Abqaiq, Har Haradh and other areas.

(iii) The availability of private vehicles and taxis in the area -

*There is no available data about vehicle passenger movement. But I made several surveys during my fieldwork (Summer 1973) both for cars and passengers travelling between Riyadh and Dammam, Riyadh and Hofuf and passengers travelling between Dammam and Hofuf. The investigations showed that an average of about 200 vehicles from all stations (Riyadh, Hofuf and Dammam) made the round trip over a 24-hour period. These figures do not include vehicles, eg trucks, other than taxis. There are no public transport buses in the Eastern Province.

where these are widely used.

(iv) The present pattern of operations on the railway network. Table 7 .6 shows that in 1972 the number of passengers travelling between Dammam and Hofuf was greater than on any other line section, with the possible exception of Riyadh.

TABLE 7.6
DISTRIBUTION OF PASSENGER MOVEMENT BY S.A.G.R. IN 1972

From	Dammam	Dammam Port	Abqaiq	Hofuf	Haradh	Al-Kharj	Riyadh	Total
To								
Dammam	-	554	1460	13072	1447	2321	25657	44511
Abqaiq	1368	-	-	4707	240	394	2051	8760
Hofuf	8676	-	1568	-	3491	2187	10339	26261
Haradh	1199	-	279	4438	-	1607	3393	9806
Al-Kharj	2448	-	354	2353	2065	-	761	7981
Riyadh	20432	-	1092	8907	4265	621	-	35317
TOTALS	34123	554	4753	32367	11508	7130	42201	132636

Source: Ministry of Finance, Central Department of Statistics
Saudi Arabian Government Railroad Organisation

(d) Functional Types of Railway Lines

One of the most important aspects of the geography of a railroad is the functions served by its various lines. In the case of Saudi Arabian Railroad, one single main line links all the stations, with branch lines to Dammam port, storehouses, the customs yard and industrial warehouses. The secondary, or branch line, serves only the industrial and commercial facilities in Dammam and in the province. The central junctions and railway crossings are at the stores and industrial warehouses. The main line from Dammam to Riyadh carries the heaviest volume of freight and traffic, and the greatest number of passengers. All trains carrying passengers, freight and fuel.

(2) Roads

The total length of roads constructed in the Eastern Province up to 1973 is 25,911 Km- 1505Km are major roads, 439Km are minor roads, and

about 647Km are local roads. A further 209.2Km were under construction and 12 Km under study.[4] The major roads link Dammam and Al-Khobar; Dammam and Dhahran; Qatif, Qaysumah via Abu-Hadriya, Al-Niariya; Hofuf, via Abquaiq and Dammam to Riyadh via Khurais. From Hofuf to Salwa in Qatar, from Dammam via Abu-Hadriya to Ras al-Khafji and Kuwait.

The minor roads link the towns and villages and the suburbs. The period between 1960 and 1970 was characterised by an increase in both the extent and density of settlement and in the growth of administrative organisations. The latter had a notable impact on the development of the road pattern which created links within the area and with other regions outside the prvince. Most roads between the towns of the province were built after 1963 along with the roads linking the Eastern Province with Kuwait in the north and Qatar in the south. Many others are under construction and study.

(a) Road System

Roads in the Eastern Province are single carriageway, with a width of between 7 and 10 metres. Those carrying heavy traffic between Dammam Al-Khobar and Dhahran should be rebuilt as dual carriageway roads for safety purposes, particularly given high densities of traffic out of Dhahran during the rush hour. The roads between Dammam and Dhahran and Dammam and Riyadh are tortuous and rough, with ramps for many kilometres and drivers do not like travelling on them. Most roads in the Eastern Province, particularly the old roads within the urban areas of Dammam, Al-Khobar and Dhahran are badly in need of rebuilding.

The existing network of the province is about one kilometre of road for every 139 people, and one kilometre of road for every 108 sq.km of land.[5]

According to the traffic offices in Dammam and Al-Hasa, the number of motor vehicles in the Eastern Province registered in 1972 was 5624. During a personal interview with the Chief of Traffice, he stated that "Most of the vehicles working within the province have not been registered here, but in other provinces of Saudi Arabia". In 1959 the number of

vehicles registered was 8708, and the highest figure ever, 21,250, was recorded in 1964. (See Table 7.7. showing number of vehicles registered in the province.)

TABLE 7.7

NUMBER OF VEHICLES REGISTERED IN EASTERN POVINCE

Year	Private cars	Taxis	Commercial vehicles	Buses	Total
1960	4414	1963	5654	397	12433
1961	4046	2196	6184	515	13951
1962	5755	2902	7376	654	16687
1963	6820	3465	8452	722	19459
1964	7545	3699	9226	780	21250
1965	-	-	-	-	- *
1966	-	-	-	-	- *
1967	906	501	541	32	1980
1968	2169	866	898	34	3967
1969	2095	875	629	53	3652
1970	1823	403	1511	109	3846
1971	1764	336	273	18	2391
1972	2603	399	2488	134	5624

Source: Ministry of Finance, Central Department of Statistics
Traffic Offices in Dammam and Al-Hasa

In 1972 the number of motor vehicles registered in the Eastern Province was approximately 17.9% of the total for Saudi Arabia.[6] (See Fig.7.2)

An analysis of road-transport in the Eastern Province has as yet not been carried out apart from some traffic counts on selected roads. Everywhere private cars and taxis are the most common form of personal transport; private cars outnumber taxis and buses, and are almost all owned by oil companies and other business enterprises for employees transportation.

Data collected during fieldwork in the summer of 1973 indicates that 34.7% of the population of Dammam travel by private car; 22.8% by taxi; 7.¾% by bus; 4.1% by bicycle and the remaining 25.4% normally travel on foot. In AlKhobar the figures were slightly different. Only 29.7%

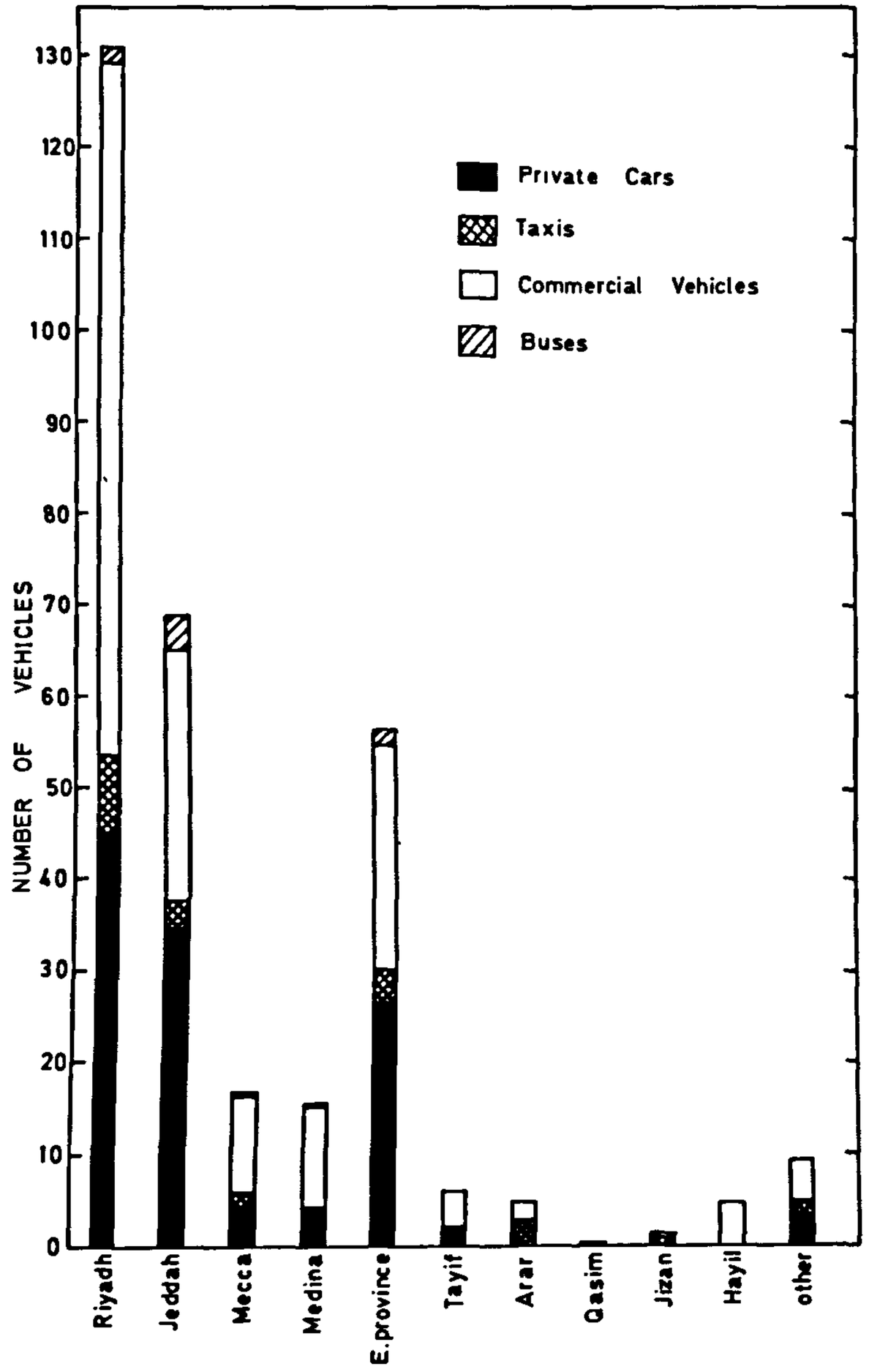


FIG.7.2 Number of motor vehicles registered in Saudi Arabia in 1972.

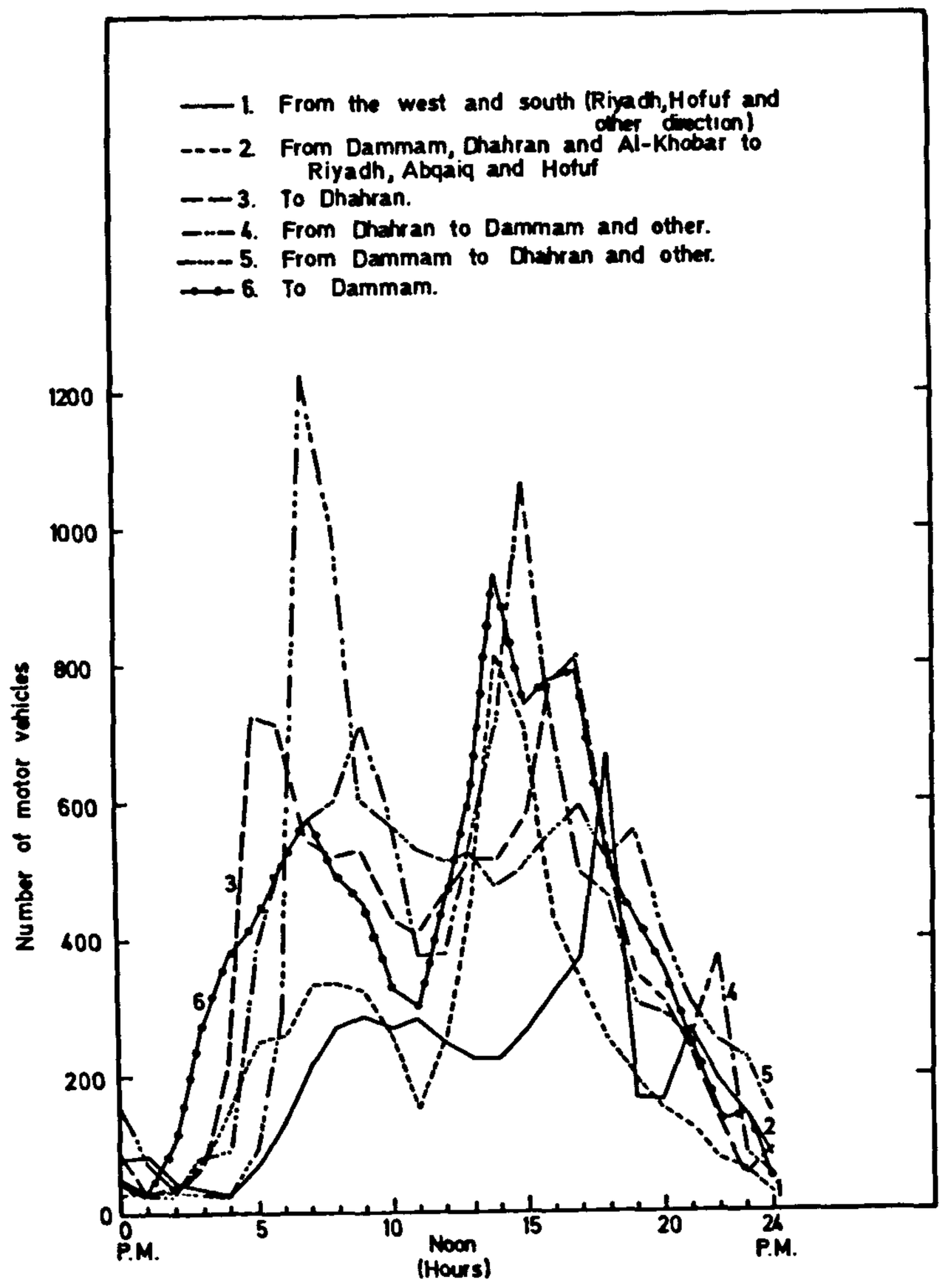


FIG.7.3 Traffic count at Dammam, Dhahran, and Abqaiq junction (May 2 to 30, 1973)

of the population travelled by private car,13.6% travelled by taxi and 21.1% were conveyed in private buses. The reason for the increase in numbers travelling by bus is that there are more foreign companies in Al-Khobar, and those who do not live near their work use company buses for transport. About 3.7% of the population sample in Al Khobar travel by bicycle, and 26.6% walk.

For long distance travel to other Gulf countries 17.2% of the people of Dammam prefer private cars, 21.5% taxis, 18.1% use private buses, 16.2% travel by air, 4.6% by train and 1.3% journeyed by sea. In Al-Khobar, about 20.4% used private cars, 26.3% travelled by air, 3.1% used private buses, 1.5% went by train and 1.2% travelled by sea.

(b) Changing Traffic on the Roads

The May 21-30 traffic survey carried out by the Town Planning Office in Dammam estimated the number of vehicles at several points travelling in and out of the urban central area of the province, and also calculated the movement within the roads of the urban area.

The first census point was at the junction of the Dammam, Dhahran and Abqaiq roads, the second at the Dammam, Dhahran and Ras Tannura road junction; the third at the junction within the central urban area of Dammam, Dhahran, Al-Khobar and Dhahran airport, and the fourth on the road between Dammam and Al-Khobar. (see Fig.7.3 and 7.4)

In Fig.7.4 is illustrated traffic flows between Riyadh and the Midland region and between the Midland region and Hofuf - essential arterial flow. From Riyadh it is possible to travel at any time to the east but this flow measurement suggests that, given a travelling time from Riyadh of between 5 and 6½ hours, departures increase steadily from midnight to give a first broad peak of arrivals between 07.00 and 11.00 hours, this followed by a further marked peak of arrivals at 18.00 hours. Arrivals then decrease rapidly suggesting an avoidance of the hottest hours of travel which would be associated with afternoon departures.

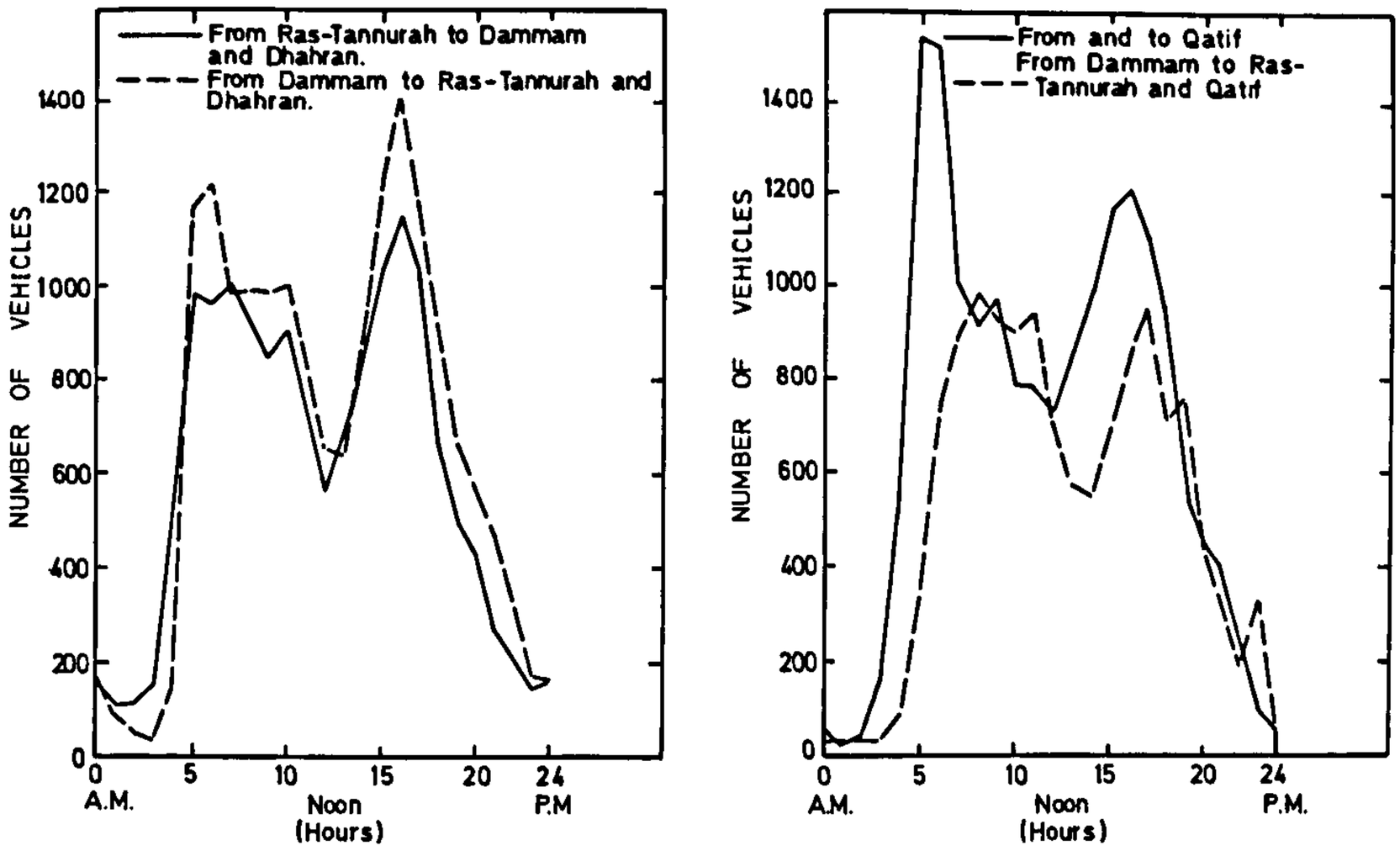


FIG. 7.4. Traffic count (1973) Dammam, Dhahran and Ras-Tannurah junction.

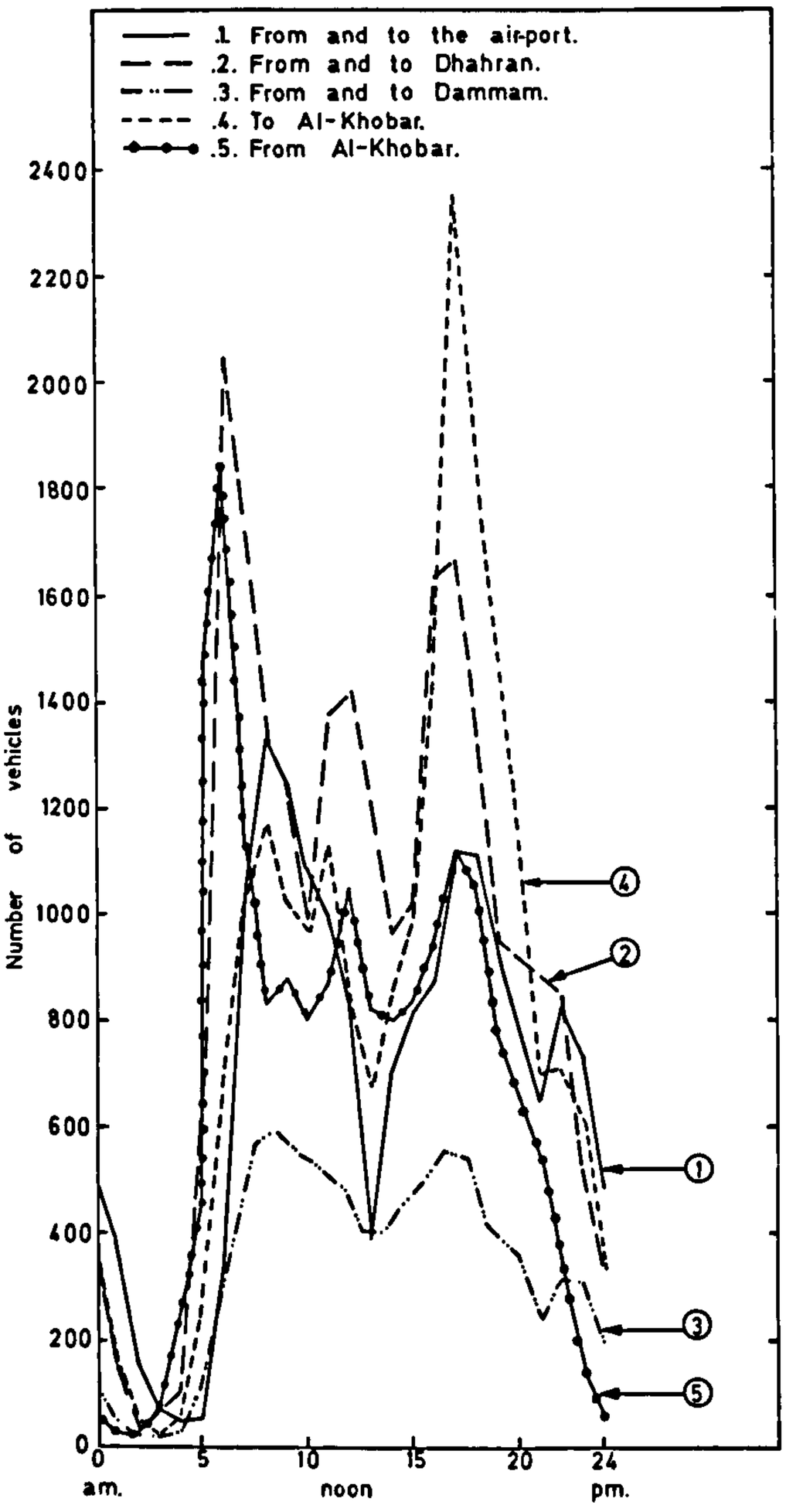


FIG. 7.5. Traffic count (1973) Dammam, Dhahran, Al-Khobar and the Air-port junction.

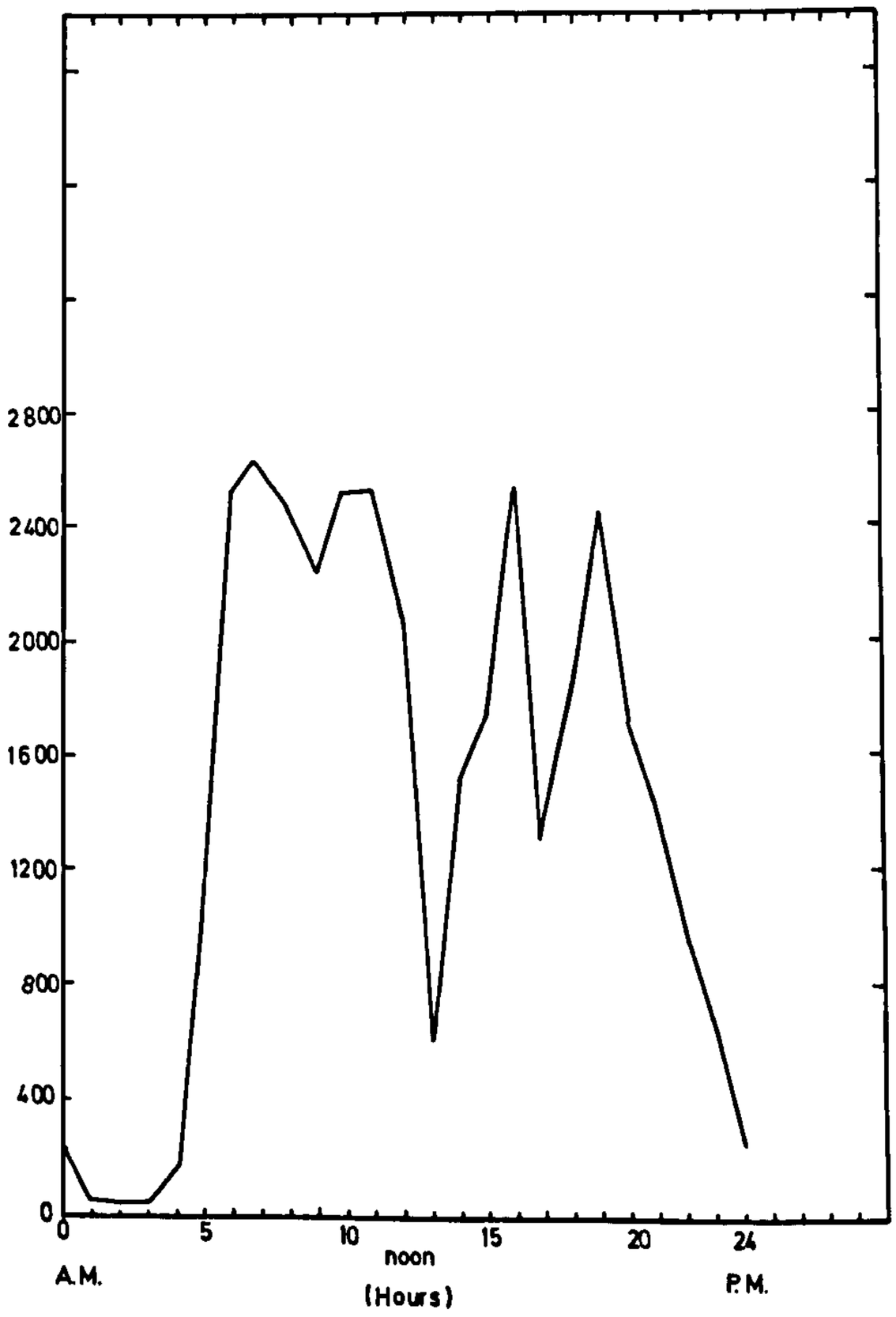


FIG. 7.6. Traffic count on Dammam/Al-Khobar road 1973.

The regional flows on the other hand have considerable variation in morning peak flows and a much more uniform late afternoon peak; clearly there are spatial as well as functional variations in transport demand. These appear more clearly explicable if we now look at the other traffic counts.

Fig.7.5 shows a traffic flow with two fairly simple rush-hour peaks, one in the early morning and one in the early evening. As we shall see later, this is consistent with the specialised functions of Ras Tannura and Dhahran as places of work rather than of residence or of services. Dmmam and Qatif appear as the sources from which passenger-traffic moves to work places in the morning and to which it returns in the late afternoon and evening. Between midnight and 2.00.am traffic was extremely light.

Dammam, Dhahran, Al-Khobar and the Airport Junction - five checks were made on the number of vehicles travelling between these points and the central urban area. The first check revealed that traffic in both directions on the road leading to the airport and the military site was heaviest at the peak travelling times for workers, approximately 8am, when 1322 vehicles were recorded, steadily increasing from 6am and decreasing after 9am. Another reason for this high figure is that aircraft departures are mostly in the early morning. The smallest number, only 46 vehicles, was recorded between 3-5am. The maximum number of vehicles travelling in both directions, as estimated by the second counter, was 1944, at 6pm rising gradually from 6am. The smallest number was 4o, recorded at 2am.

Counter No.3 recorded vehicles to and from Dammam and other directions. The maximum was 596 at 8am and 5pm and the minimum 20, at 3am. Vehicles travelling to Al;Khobar from the airport, Dhahran and Dammam were recorded by Counter 4. The highest figure was 2169 vehicles at 5pm the peak period for afternoon shopping, and the smallest, 27, at 3am. Counter No.5 recorded vehicles in both directions between Al-Khobar and Dhahran airport. A peak figure of 1849 vehicles was recorded at 6am and 5pm the rush hours for employees of the oil companies and other firms the minimum number, only 24 vehicles, being recorded after midnight, at 2am. (see Fig.7.5)

Damman Al-Khobar Road - traffic between these two most important cities in the Eastern Province, is usually heavy. The highest number of vehicles travelling in both directions at 7am was 2672, and the minimum number of vehicles was recorded after midnight, at 1am. In the cities of the Eastern Province, as in most cities in Saudi Arabia, the normal peak periods for heavy traffic, apart from rush hours for workers, are in the early evening (5-9pm) when most people prefer to do their shopping and other activities, as in summer, this is the coolest part of the day. (See Fig.7.6)

C. Communications

1. Telephone Services

Telephone services in the Eastern Province have been developed and expanded over the past 10 years (see table 7.8).

TABLE 7.8

OPERATIONAL TELEPHONE LINES 1970-72

City	No.of Lines	Increase		
		1970	1971	1972
Dammam	6000	2725	3218	4085
Al-Khobar	4000	2411	2744	3155
Hofuf	4000	-	-	1563
Qatif	1000	-	-	475
Syhat	600	-	-	163
TOTALS	15,600	5136	5962	9441

Source: Ministry of Finance, Central Department of Statistics

About 34.7% of the population sample in Dammam and 41.2% in Al-Khobar had private telephones.[7] This is about the same as the estimate by the Post Office that about 40% of town dwellers have private telephones.

In December 1973 contracts were signed with a number of firms for a further expansion of the telephone network, providing 6000 lines for Dammam, 2000 for Al-Khobar, 4000 for Hofuf, 1000 for Qatif and 400 for Abqaiq and a 600 line network for Ras Tannura. When this new scheme is completed during the next few years, the total number of automatic lines operating in the Eastern Province will rise to 30,600.[8]

A 300 channel international telecommunications microwave link was established between Dmmam and Bahrain by the end of 1971, and a 450Km coaxial cable was established between Dammam and Kuwait.

Aramco has its private automatic telephone exchange, and all its communities are provided with both business and private telphones. These are linked by very high frequency (VHF) multichannel radio trunks and the radio station at Dhahran. Throught its network of circuits Aramco has virtually instant communication between its headq uarters in Dhahran and its offices in New York City and The Hague.

2. The Postal Service

The number of postal services in the Eastern Province has grown remarkably over the past few years. In 1970 the total number (outgoing and incoming) of all postal types was about 9 million units, rising to 10,798,000 in 1972, an increase of 20% (see Table 7.9).(9)

TABLE 7.9

GROWTH OF POSTAL SERVICES (IN THOUSANDS) IN THE PROVINCE

Year	Letters	Parcels	Printed Matter	Telegrams	Total
1970	7464	40	1148	348	9000
1971	7803	50	1265	393	9511
1972	8618	53	1488	639	10798

Source: Ministry of Finance, Central Department of Statistics

In 1972 the Eastern Province had a 9.8% share of the total post in Saudi Arabia, and occupied third place of all provinces for volume of post. The Western Province was first, with a 47% share of the total post. (see Table 7.10.)

TABLE 7.10

AMOUNT OF POST IN SAUDI ARABIA IN 1972

Province	Letters	Parcels	Publications	Telegrams	Total	%
Central	27776	86	3337	4558	35757	32.5
Western	46116	82	2805	2600	51603	47.0
Eastern	8616	53	1488	639	10798	9.8
Medina	6260	35	259	568	7122	6.5
Southern	3947	-	316	334	4597	4.2
TOTALS	92717	256	8205	8699	109,877	100

Source: Ministry of Finance, Central Department of Statistics

D. Conclusion

The growth of the cities, and increased business in the commercial industrial and other sectors and the increased number of motor vehicles in the region, all weigh heavily on the transport and communications network, and provide many complex problems for the transport and traffic authorities.

The roads linking the towns all carry two-way traffic even in the heavy traffic areas of Dammam, Al-Khobar and Dhahran. The traffic in these areas is very heavy during rush hours, slow moving, and with many accidents caused by drivers overtaking at high speed. Personal interviews with many drivers indicated that 90% of them thought that most road accidents were caused by the two-way traffic on narrow roads, especially near Dhahran.

There are severe parking problems in the city centres, where no parking is available except for parking strips in some of the newer streets, and these are not even sufficient for vehicles of shoppers in the city centre; the demand for improved parking facilities is great.

Taxis cruising around empty looking for fares are a common sign everywhere in the city. This influences traffic movement and there is a need for parking space for these taxis somewhere in the city centres.

Transport between Dammam and Al-Khobar, the port of Dammam and the airport in Dhahran is not regular, even during business hours, and there is a long wait for taxis (the most commonly used form of transport). Even when a taxi is available, it must often be shared since the cost in a shared taxi is only one Riyal per person, but waiting until the taxi is full makes a journey longer. Often the cost of hiring a taxi for only one person, is particularly prohibitive to the lower paid, as the journey could cost five or six Riyal.

With reference to the population sample interviewed in Dammam and Al-Khobar during my fieldwork, it was evident that not everyone could afford to hire a car or taxi for every journey they undertook. This large section of the population were therefore obliged to walk, and it

is obvious that the provision of a good system of public transport serving the cities and towns of the area is an extremely urgent matter.

The sub-regional characteristics of settlements appear very clearly in any examination of the main communication system. Above all a 'Golden Triangle' between Dhahran, Al-Khobar and Dammam is very evident. Here is located the major regional airport and one of the two main Saudi Arabian international airports. Dammmam has a similar status as a seaport and nearby Ras Tannura is the great oil terminal port. In this triangle is the only clear provincial inter-urban road network which carried the highest traffic density. Urban traffic is heaviest within these centres and even though road and street patterns are predominantly recent in origin, already they are overwehelmed by road vehicle movement. The older centre of Hofuf still retains internally much of its old pattern and appears relatively isolated in terms of communication. All this reflects the recent and growing dominance - in terms of all activity - of the three new cities.

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CHAPTER EIGHT

Sample studies of recent growth and functions of selected urban centres.

INTRODUCTION

So far in this study we have examined the Eastern Province of Saudi Arabia mainly from a regional point of view. The facts of the physical environment and the responses made by the human population through traditional evaluations of those resources available in the pre-oil era were considered in general functional and locational terms. Agriculture, fishing and a small volume of trade in simple primary commodities had their characteristics almost wholly determined by some dominant and locational ecological facts. In turn, the nature, functions and location of settlements were determined by these facts and the forms of economic activity which were possible.

In the examination of the region's population greater attention was focussed on the more recent period in which oil exploration and export, and the rapid rise in national oil revenue became significant. In those demographic trends which could be identified especially in migration, the effects of new resource and wealth availability were exposed. In particular changing population distribution and the growing concentration of people in urban settlements became central to our theme. Industrial development, including that of petroleum, is clearly the production economic force producing change and we saw, in the general survey of industry, how new factors have changed the landscape of the Eastern Province in locationally selective ways.

Whether in population trends, in industrial establishments, in changing transport networks or the availability of social services, the dominance of new urbanisation can be seen. In size, in rates of growth and in function a marked differentiation has appeared between settlements and between sub-regions of the Province. We must now turn to a direct study of the urban settlements themselves.

The first clear differentiation is that between the old-established urban settlements and those which are either completly post-oil in date,

as with Dhahran, or are so heavily dominated by post-oil developments as to be virtually new towns, e.g.Al Khobar. Already however, in the preceding chapters we have seen that there is more variety in characteristics than just this two-fold division. In order to analyse this variety and establish some spatial aspects of inter-urban relationships we have to turn to more detailed case-studies.

As pointed out in the introduction, there is very little published data on the evolution and functional characteristics of these settlements and therefore the approach has had to be based on the reconstruction of the morphological and spatial changes in some of the sample settlements. The distribution of phenomena such as retail trade, manufacturing industry and recreational facilities etc.could only be established by field observation. It was therefore necessary given the practical limitations of time to be selective in the sample studies.

In the Eastern Province we have some old-established urban settlements, Hofuf and Qatif, based on the oases of Al-Hasa and Qatif.

Dammam and Al-Khobar represent two virtually brand new settlements, which have been transformed from very small coastal villages into towns as the result of the advent of oil, and which have become the main centres of the Eastern Province as a whole; as we shall see Dammam is the administrative capital and industrial centre and Al-Khobar has become the specialised shopping centre and a residential town especially for the oil employees.

Dhahran does not belong to either of these previous types, but represents a specialised type of oil town, the headquarters of the oil company (Aramco), and in some ways is an alien transplant. These five settlements were settled as sample case-studies since between them are represented all the major types of urban settlement which could be identified using the data presented in earlier chapters. Ras Tannura was excluded since it is not so much an urban settlement as the site for an oil terminal and refinery. Hofuf and Qatif were included because of major

obvious differences in spatial location; Qatif an oasis town affected by the near proximity of very recent and different economic activity, Hofuf an oasis town distant from the central region of diverse growth.

First, from the data given in Chapter 6 the general points which can be made concerning the relationship between the growth of the oil industry and the growth of settlements, points which are explored further in the case-studies.

As Dammam Dome was the first field to produce oil in 1938, there was established there the first camp, in Dhahran; this grew in size and in time became Dhahran, the oil town, and now headquarters of the oil company.

During the time of the first production of oil Dammam was a small coastal fishing village, and the tiny huddle of fishermen's huts of Al-Khobar offered neither living quarters nor supplies of food and other goods necessary for the oil men.

In Dhahran the building of the residential area began in 1936, and this was followed by the provision of what were essentially more highly developed camp services for an immigrant, expert and mainly alien population. Dhahran became a self-contained community.

The embryo oil industry and the new community of Dhahran also affected the tiny village of Al-Khobar, where a small storage and shipping terminal was built connected by pipeline to Al-Khobar. Small shops appeared in Al-Khobar selling a variety of goods to the oil men. As the tempo of oil prospecting increased, the first growth began with the first town planning done by Armaco in 1947, for both Al-Khobar and Dammam. Both communities grew rapidly with offices, shops, streets, clinics, schools, houses and other facilities. A whole new settlement pattern came into existence consisting of nine towns and cities, Al-Khobar, Dammam, Thuqbah, Ras Tannura, Rihaimah, Dhahran,Abqaiq, Rajihah and Al-Udailiya.

The new communities, three types of which are examined in later chapters, can be divided into four groups from the point of view of their development in an industrial context:

(a) The main oil towns:

(i) Ras Tannura is the oil exporting terminal and a refinery site grew up there after 1940.

(ii) Dhahran became the headquarters of the oil company after 1940.

(iii) Abqaiq had grown to become the second oilfield production centre by 1958 and a town slowly grew around the oil camp and cantonment.

(b) The new housing sites of the oil company employees almost all situated near the oil industry, e.g.Rihaimah (near Ras Tannura) and Rijihah (near Abqaiq) were established by 1952, and developed by the local oil employees.

(c) Sites partly populated by employees of the oil companies grew up close to the existing local settlements, to the west of Al-Khobar, the south of Dammam and at Safwa and Syhat in Qatif oasis.

(d) The new urban centres of Al-Khobar and Dammam started to develop after 1940 and expanded into densely built-up areas on each side.

The three cities of Al-Khobar, Dammam and Dhahran together constitute an urban region with oil and private industrial, commercial and administration centres. The population growth increased with the influx of new arrivals, and the new urban centres are likely to benefit increasingly from the further growth of industrialisation and commerce. The population of the old urban centres of Hofuf, Mubarraz and Qatif also increased and the built-up areas expanded, but these settlements were of secondary importance to the central business areas of Al-Khobar and Dammam. In 1951 Dammam, Dhahran, Abqaiq and Hofuf were linked by rail with Riyadh, the capital. The railway was headed by the new port terminal in Dammam, and was also linked by asphalt road with Riyadh, Qatar and Kuwait. In the 1960s the Petroleum College and the international Airport were constructed in Dhahran, further increasing the growth potential of that city.

The consideration of transport and communication made in Chapter 7 can also be extended to allow of an examination of the street patterns in the urban centres of the Eastern Province in order to give a preliminary indication of their varying characteristics.* Particularly in the old and traditional cities of Qatif and Hofuf, streets generally .....

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*The street plans illustrated in Fig.8.1 are shown on scales suitable to specify settlement size rather than on a uniform basis.

follow an open circuit pattern, with the main street running in the middle, as a backbone, and the other streets running from each side of the city to this central backbone. The existing layout of streets within these cities, where most streets converge on the main street, causes traffic congestion, as most traffic concentrates in one street. (e.g. Saud Street in Dammam; Prince Khalid Street in Al-Khobar; Al-Shair al-Uam Street in Qatif; and Khamis Street in Hofuf). (See Fig.8.1.) Street patterns almost invariably follow grid-iron models, on the other hand, in the new cities even influencing the older parts of the settlements especially in Dammam and Al-Khobar. In the oil town of Dhahran the street pattern illustrates clearly the special and 'artificial' character of the settlement because, despite the fact that the original plans for Dammam Al-Khobar and Dhahran were similar, the last has a street layout like a small American town.

(a) Types of Street Pattern

Both old and new street patterns exist side by side in many of the cities and the province. The streets of Qatif and Hofuf follow the old pattern; although the major streets of these cities have been modernized, the others are mediaeval and characterised by their narrow width and cul de sacs. Some are only suitable for pedestrians and small vehicles and are impenetrable for modern vehicles.

Modern street patterns are dominant in the new cities of Dammam, Al-Khobar and Dhahran. The major streets carry the heaviest traffic volume, particularly in Dammam and Al-Khobar, and are designed to run straightfrom north to south and east to west, crossing each other at right angles.

(b) Width of Streets

The overall width of streets in major cities is 10 metres or more. In Dammam there are 320 cross sections* of existing streets, 19.1% of them

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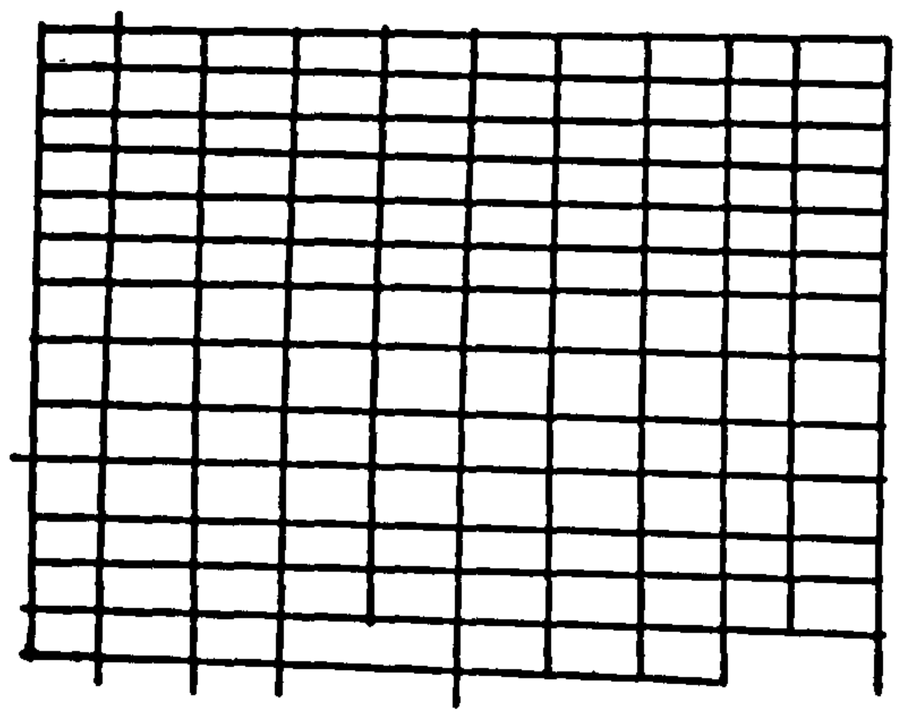
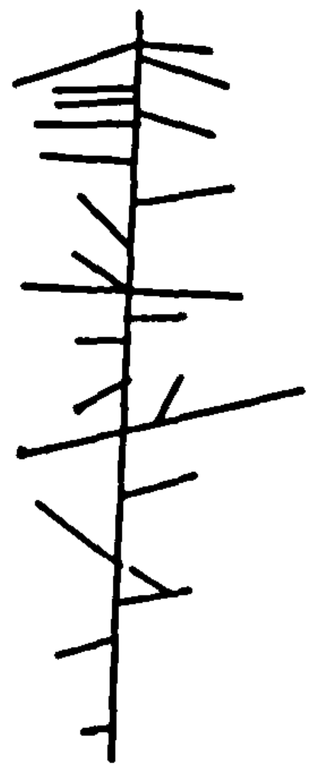
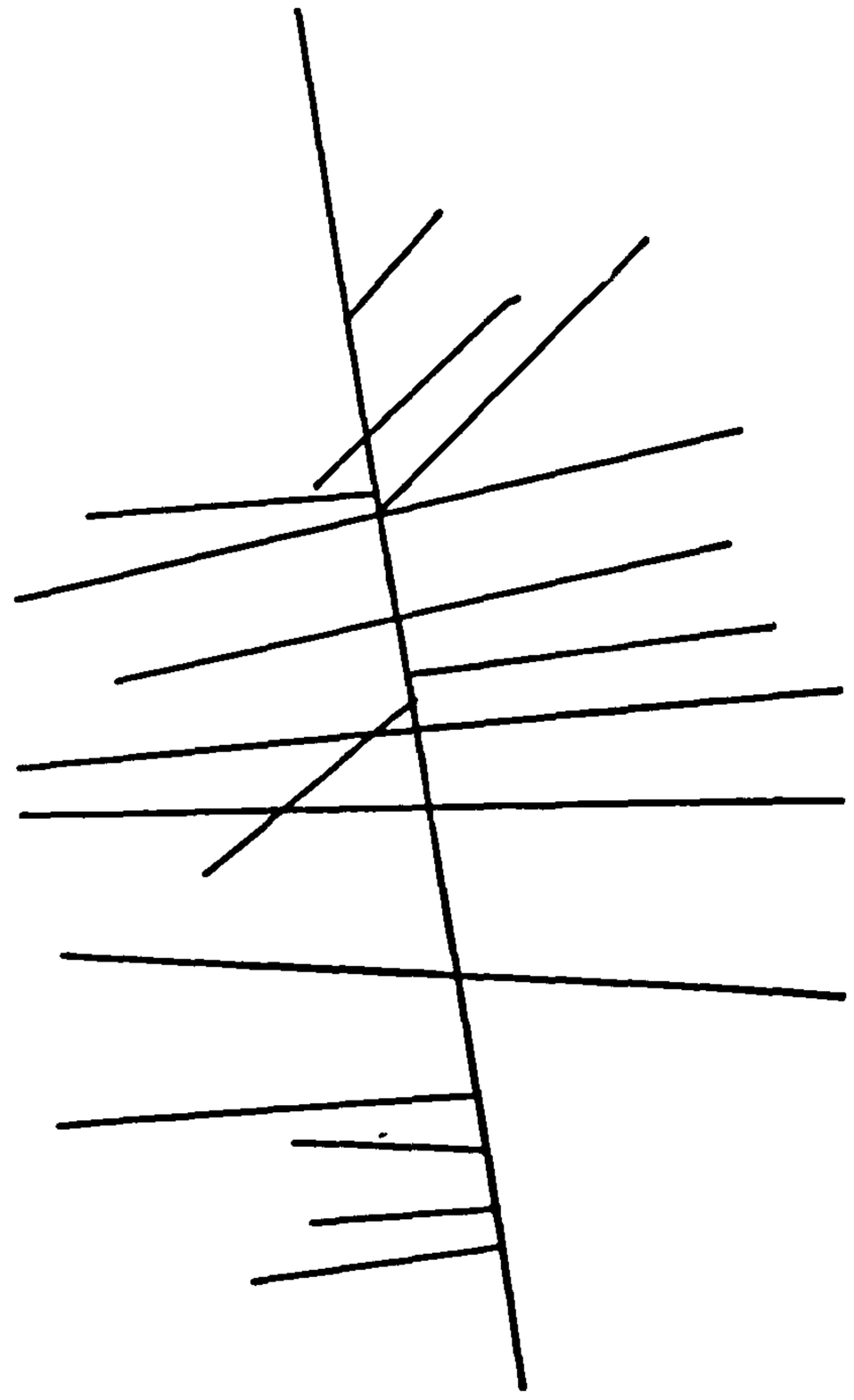
* A cross section, according to the Doxiades terminology used in Saudi Arabia, is the section across any street at any type of junction with any other. A T-junction consists of 3 cross sections, a crossroads of 4.

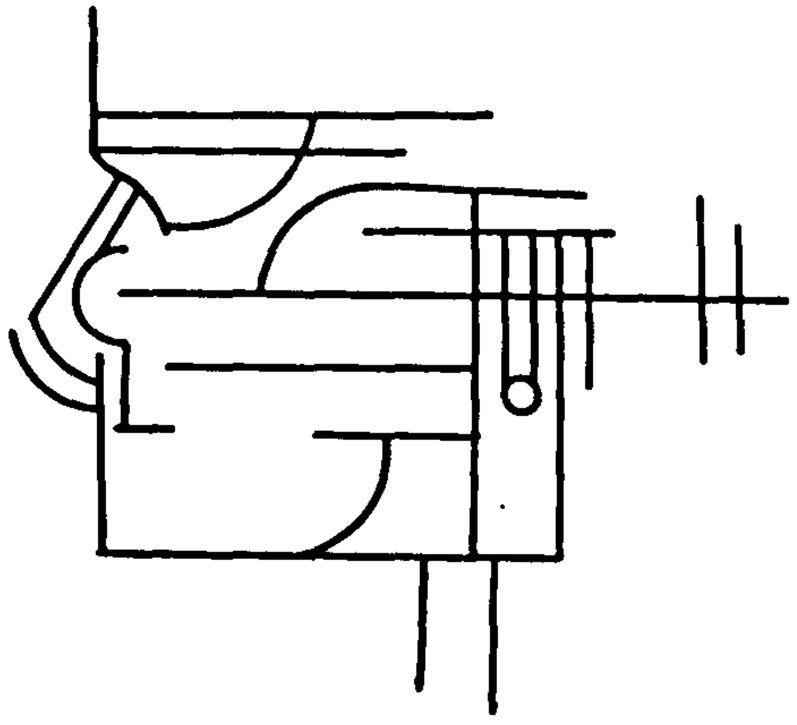


DAMMAM & al-KHOBAR



QATIF





DHAHRAN

HOFUF

FIG. 8.1 Street plans models of the main urban centres in the Eastern Province.

below 10 metres and the remainder having a maximum width of 10 metres. In Al-Khobar there are 292 cross sections, 6.2% being less than 10 metres in width, and 93.8% having a minimum width of 10 metres. Hofuf has 227 cross sections, 40.5% less than 10 metres wide and 59.5% being wider than 10 metres.[1] Qatif has about 50 cross sections, 24.0% being greater than 10 metres wide, and 57.0% below, the arrowest street being only 2-3 metres wide. In Dhahran the street pattern is different, and planned with islands in the centre; there are about 100 cross sections of existing streets, 30.0% being major streets up to 50 metres wide (both sides of the street including the islands), 20.0% were minor streets between 10 and 20 metres wide, the remaining 50% being local streets less than 10 metres wide.[2] (See Fig.8.2 showing the width of the streets.)

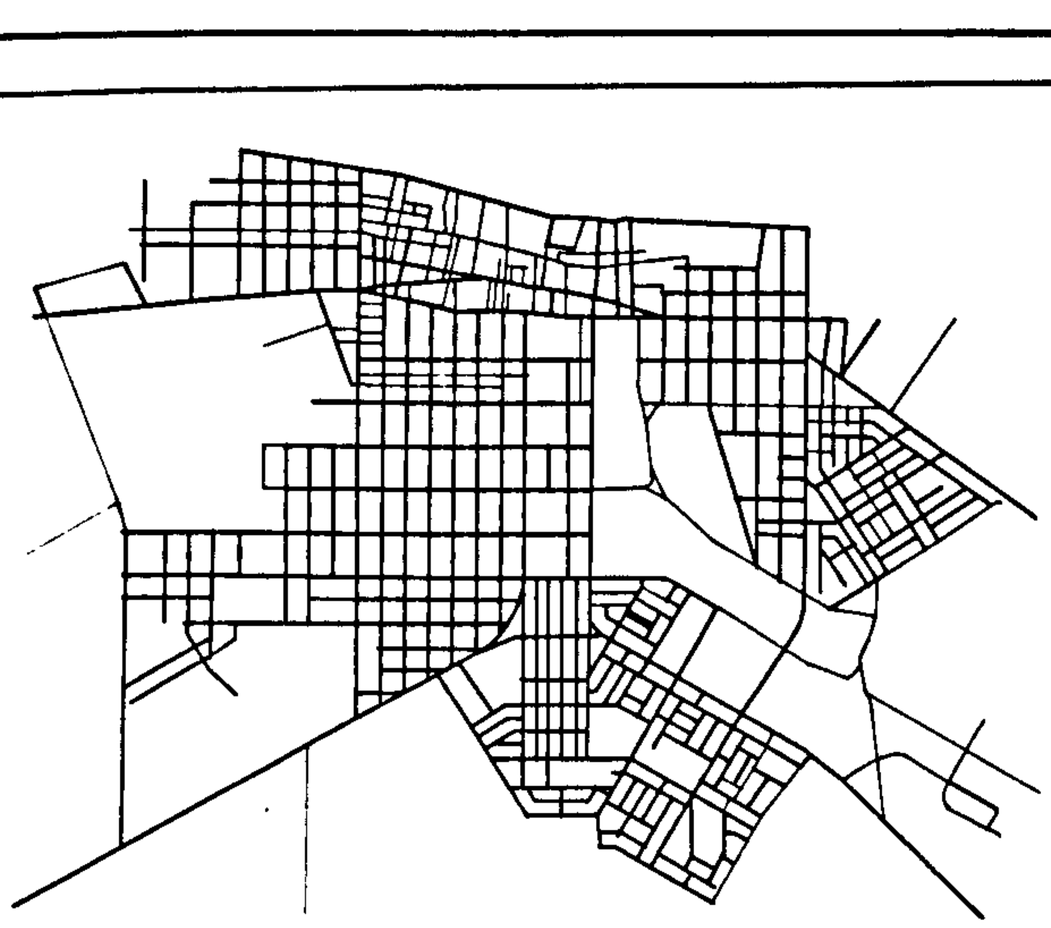
(c) Condition of the Streets

It can be seen that most streets in the major cities are wider than 10 metres, but some are not wide enough to allow for two-way traffic. Generally although streets are mostly paved they are in need of maintenance and in certain parts of each city complete reconstruction is necessary (see Fig.8.3.showing condition of streets).

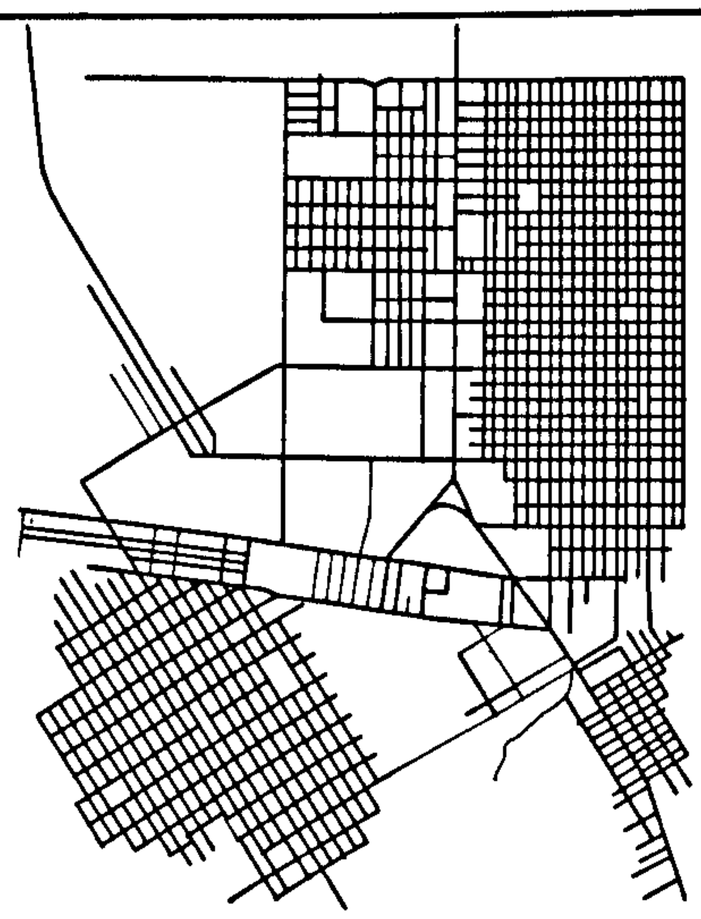
Streets normally have footpaths on both sides; the width of these footpaths varies from 2-5 metres in Dammam and up to 7.5 metres in Al-Khobar, and between 2-8 metres in Hofuf. Normally footpaths are only found in major streets in the central part of the cities; the old streets being only 2-3 metres wide and having no room for the provision of footpaths.[3]

(d) Street Lighting

Almost all cities in the Eastern Province have street lighting but the quality of the lighting is relative to the importance of the street (see Fig.8.4). Power is supplied through underground cables by the city's electricity network, set out from the corresponding distribution panels. On single line streets a light is usually set at the side of the footpath, while on two-way streets, a double light is usually placed in the centre.

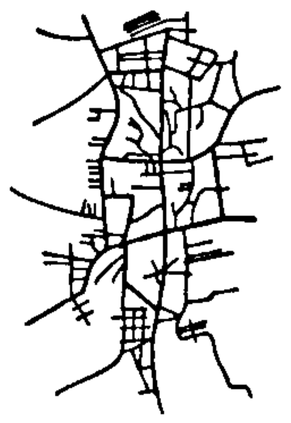


1 - DAMMAM

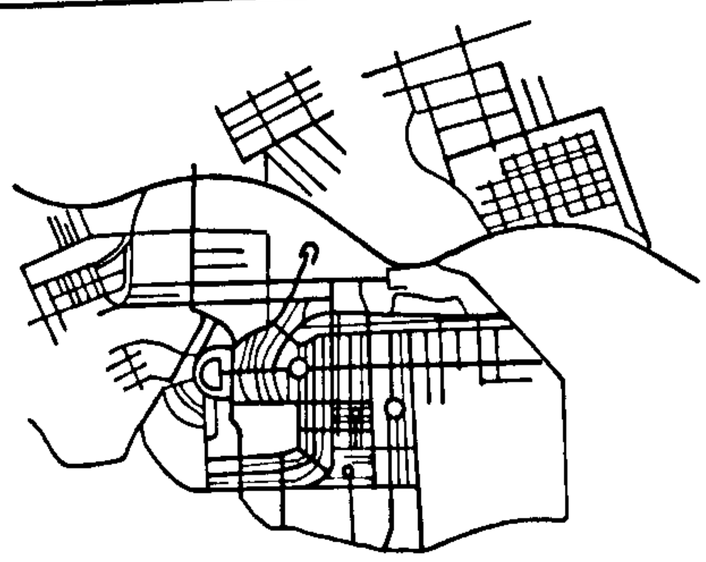


2 - AL-KHOBAR

3 - HOFUF



4 - QATIF



5 - DHAHRAN

4 & 5 Fieldwork

1 2 & 3 after Doxiadis

1000 500 0 1000 2000 3000 4000

metres

N

——— Street width 10 metres & over. ——— Street width less than 10 metres.

FIG 8.2 WIDTH OF STREET PATTERN IN THE MAIN URBAN CENTRES (1973).

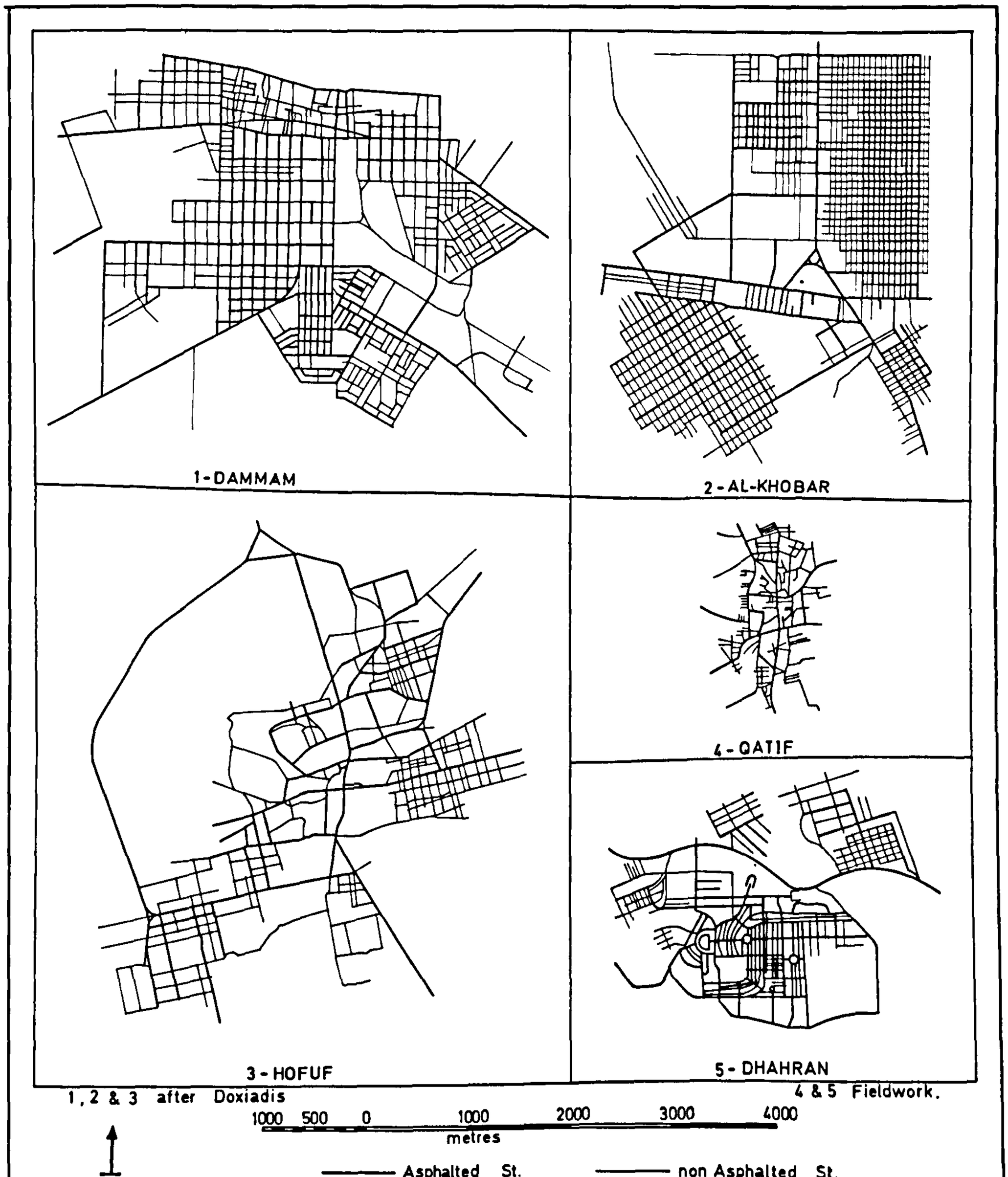
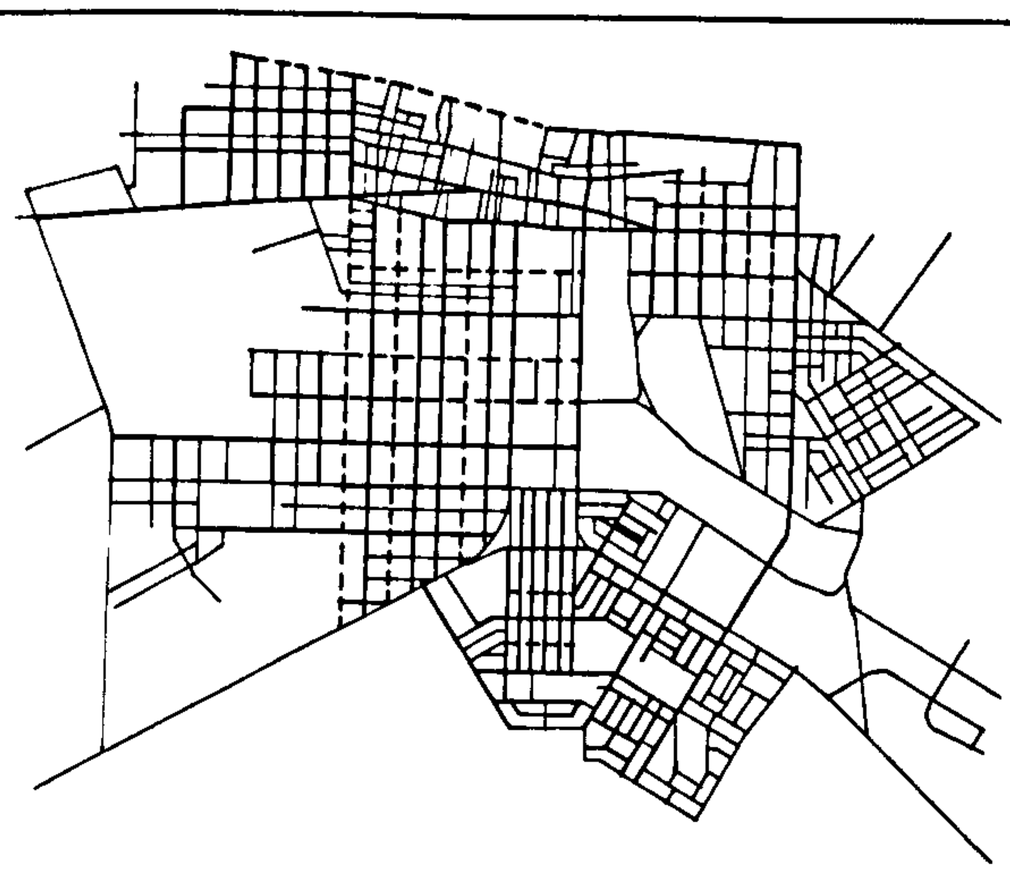
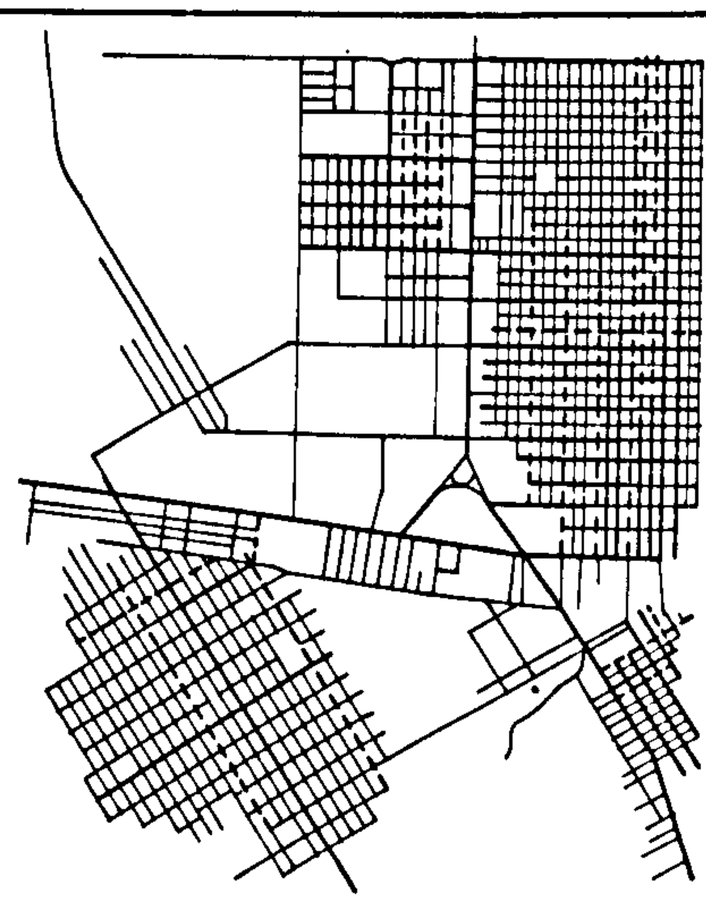


FIG. 8.3 CONDITION OF STREETS PATTERN IN THE MAIN URBAN CENTRES (1973)

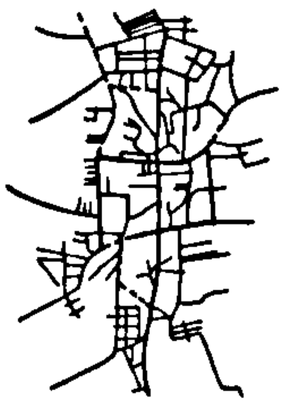


1-DAMMAM

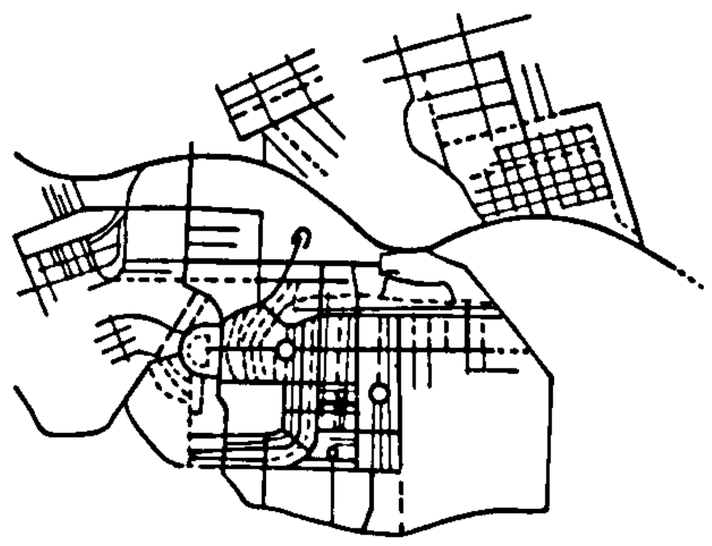


2-AL-KHOBAR

3-HOFUF



4-QATIF



5-DHAHRAN

1,2 & 3 after Doxiadis.

4 & 5 Fieldwork.

1000 500 0 1000 2000 3000 4000

metres

N

——— Sufficient Street lighting ------ In Sufficient Street lighting

——— Non Street lighting

FIG. 8.4 STREET LIGHTING CONDITION IN THE MAIN URBAN CENTRES (1973).

Lights are usually between 6-10 metres high and between 24-80 metres apart.[4]

4. Functional Classification of Street Patterns

Existing streets in major cities of the Eastern Province are broadly classified according to their importance as road routes and there are four types, classified as follows: (See Fig.8.5)

(a) Major Roads

These connect those urban centres with populations in excess of 25,000 and cater for heavy traffic travelling long distances. In Dammam the major road link the city centre via Dhahran road with the towns of Dhahran and Al-Khobar. The city centre at Al-Khobar on the other hand, is not linked with a major road, but the major roads of Al-Khobar run west between Al-Khobar and Al-Thuqbah to Dhahran and to the north between the north and west of Al-Khobar to Dammam. In Dnahran the major road runs east and north, between Dhahran quarter and Al-Monirah quarter to Al-Khobar and Dammam. In Hofuf the major road runs from the north and links Al-Mubarraz city with Hofuf city centre. This street carries the heaviest volume of all urban traffic.

(b) Minor Roads

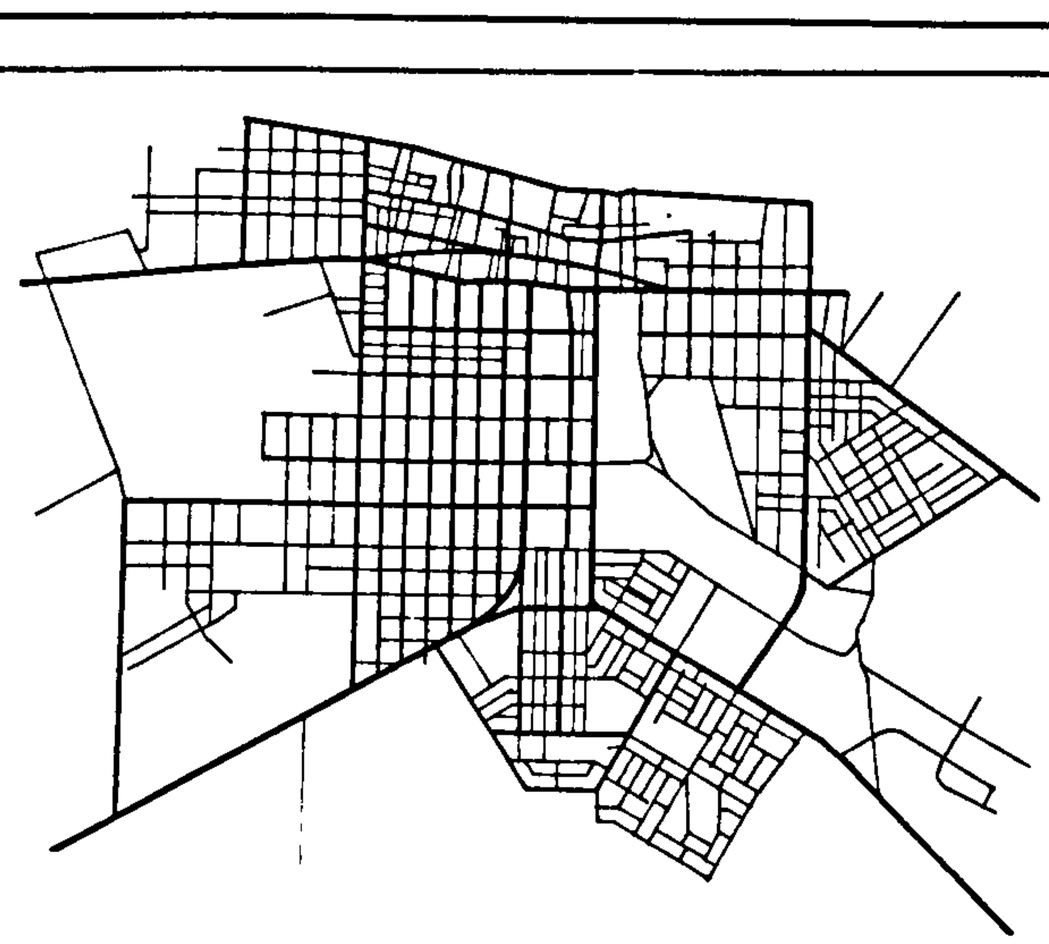
These normally connect small towns and cities and other sources of traffic in urban areas. They inter-connect with, or complement, the major roads, and are normally used for shorter trips, as speeds are somewhat slower.

(c) Connecting Roads

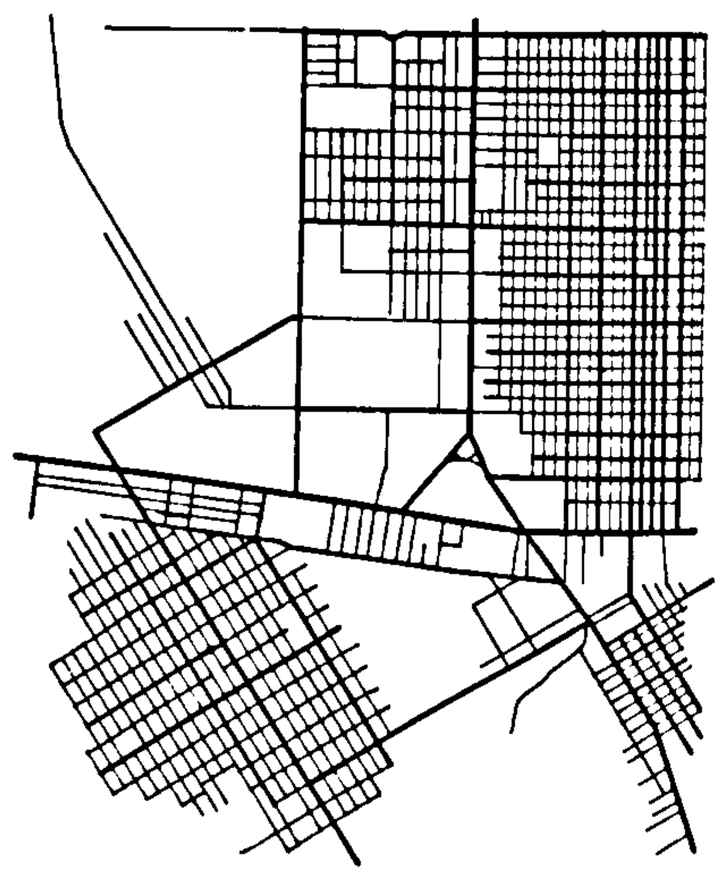
These are intended for short urban trips and direct communication within the city's main network. They are normally used for direct access to the city centre, but also collect the flow of traffic from the local streets of the community, and connect with the major roads.

5. Hourly Traffic Volume

The business and administrative centres of the Eastern Province are almost all within Dammam, Al-Khobar and Dhahran, the 'Golden Triangle' or at a lower level in Hofuf in Al-Hasa Oasis. The heavy volume and mixed concentration of traffic in the city centres is created by the necessity for the daily conveyance of large numbers of people to and from their place

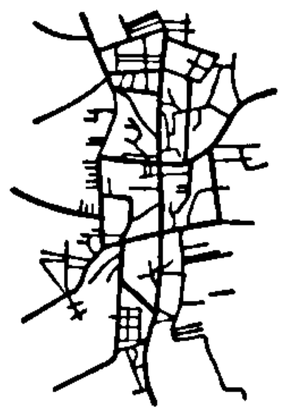


1-DAMMAM

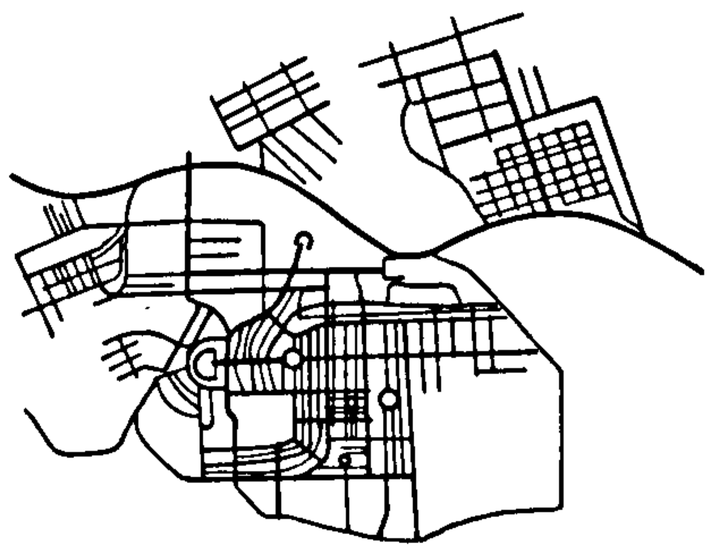


2-AL-KHOBAR

3-HOFUF



4-QATIF



5-DHAHRAN

1, 2 & 3. after Doxiadis.

4 & 5. Fieldwork.

1000 500 0 1000 2000 3000 4000

metres

N

Major St. Minor St. Collection St. Local St.

FIG. 8.5 CLASSIFICATION OF STREETS PATTERN IN THE MAIN URBAN CENTRES. (1973).

of work, or for business, shopping and other purposes. The main, and most commonly used form of transport is taxi; buses are all privately owned and are used solely by the oil companies, schools, etc.

There is a great deal of heavy traffic on the roads between Dammam, Al-Khobar and Dhahran, in addition to traffic converging on these cities from elsewhere. All these roads have peak hours for traffic, which are during the morning and afternoon rush hours, and between 4-5pm and 9pm. During these hours the roads carry a heavy volume of traffic in all cities. Peak hours in the major cities are as follows: (Town Planning Traffic Survey May 18-27 1973).

Dammam - The average number of vehicles per hour in the main street (Saud Street) was 100, and in Shari'a al-Jami'a the main commercial street and the location of the Friday mosque, it was 1800 per hour. The maximum number of vehicles in Saud Street at 9am in the morning was 1046 and at 5pm in the afternoon it was 1306. Only 3 vehicles passed between 2-3pm. In Shari'a al-Jami'a the maximum was 1623 at 10am and 2131 at 5pm while only 3 vehicles were counted at 1am. In Dhahran Road which links Dammam city centre with the Aramco employees' site south of Dammam, and the major road to Dhahran, the maximum number, at 6pm was 2530 and the minimum, at 3am was 11. For vehicles going to Faisal Street in the city centre, the highest number counted was 2622 at 5pm, and the lowest was 4 vehicles at 3am.[5] (See Fig.8.6 showing hourly traffic changes at several points in Dammam).

Al-Khobar - the average number of vehicles flowing to and from the shopping centre in Khalid Street over a one-hour period was 1500. In Al-Khobar the traffic is at its highest peaks in the morning, but rises during the hours of 4-5pm until 9pm, the main times for shopping. A maximum number of 1494 vehicles passed through Khalid Street in the morning between 11am and 12 noon, and this increased to 2213 vehicles around 6pm. The smallest number was after midnight, at 3am.[6] (see Fig.8.7)

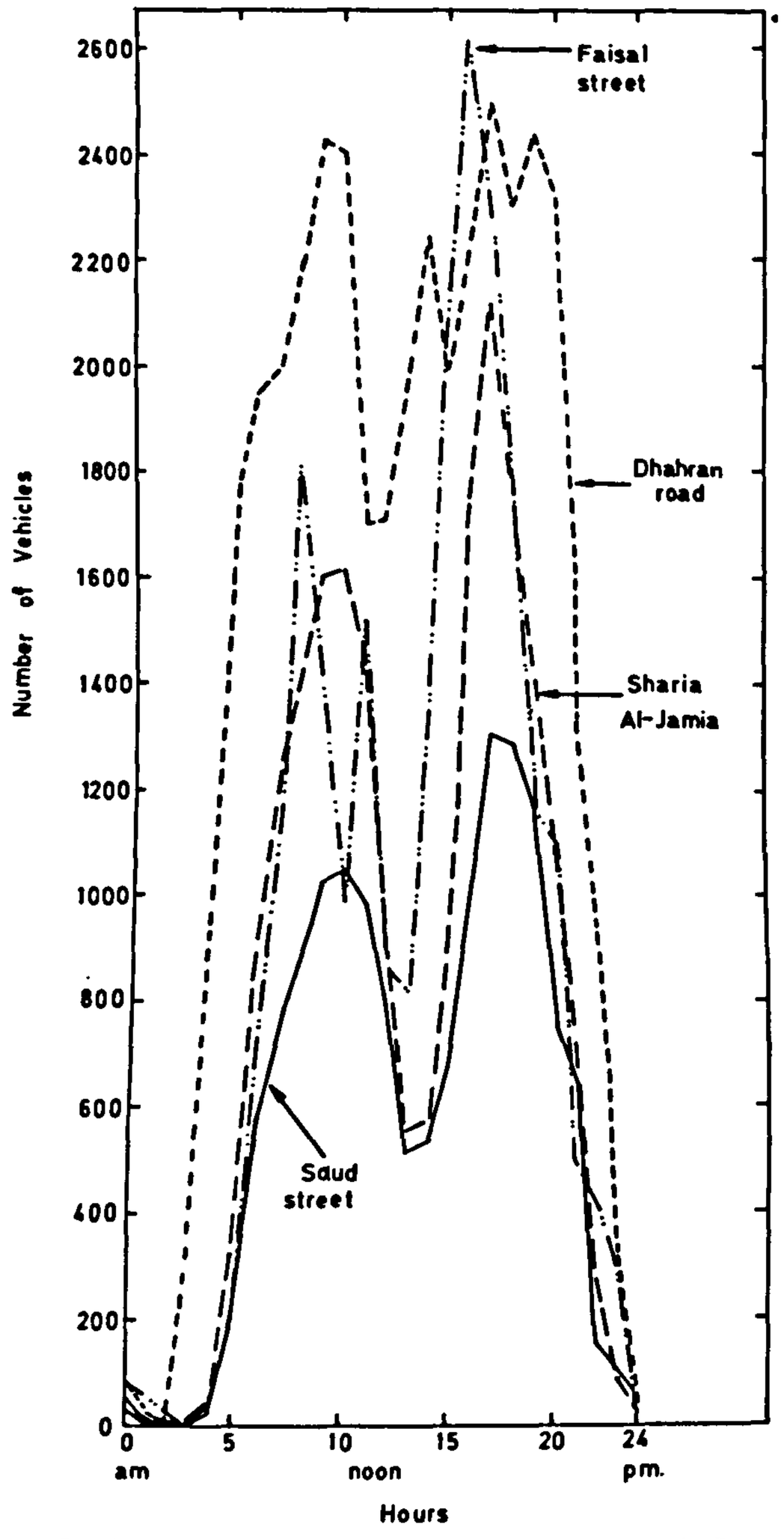


FIG. 8-6. Changing traffic in the centre of Dammam. (1973)

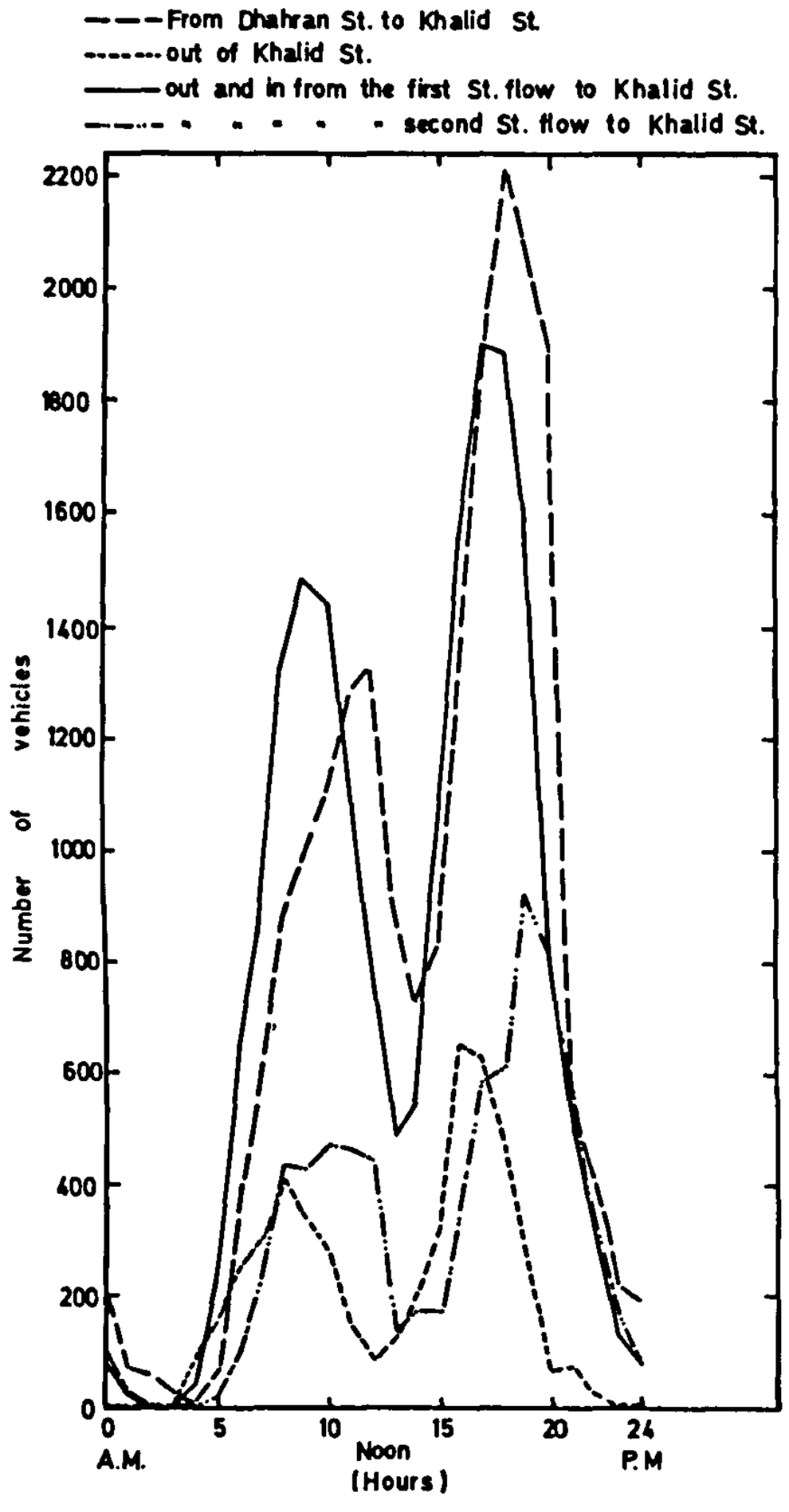


FIG. 8-7. Changing traffic in the centre of Al-Khobar (out and in) at Khalid Street. (1973)

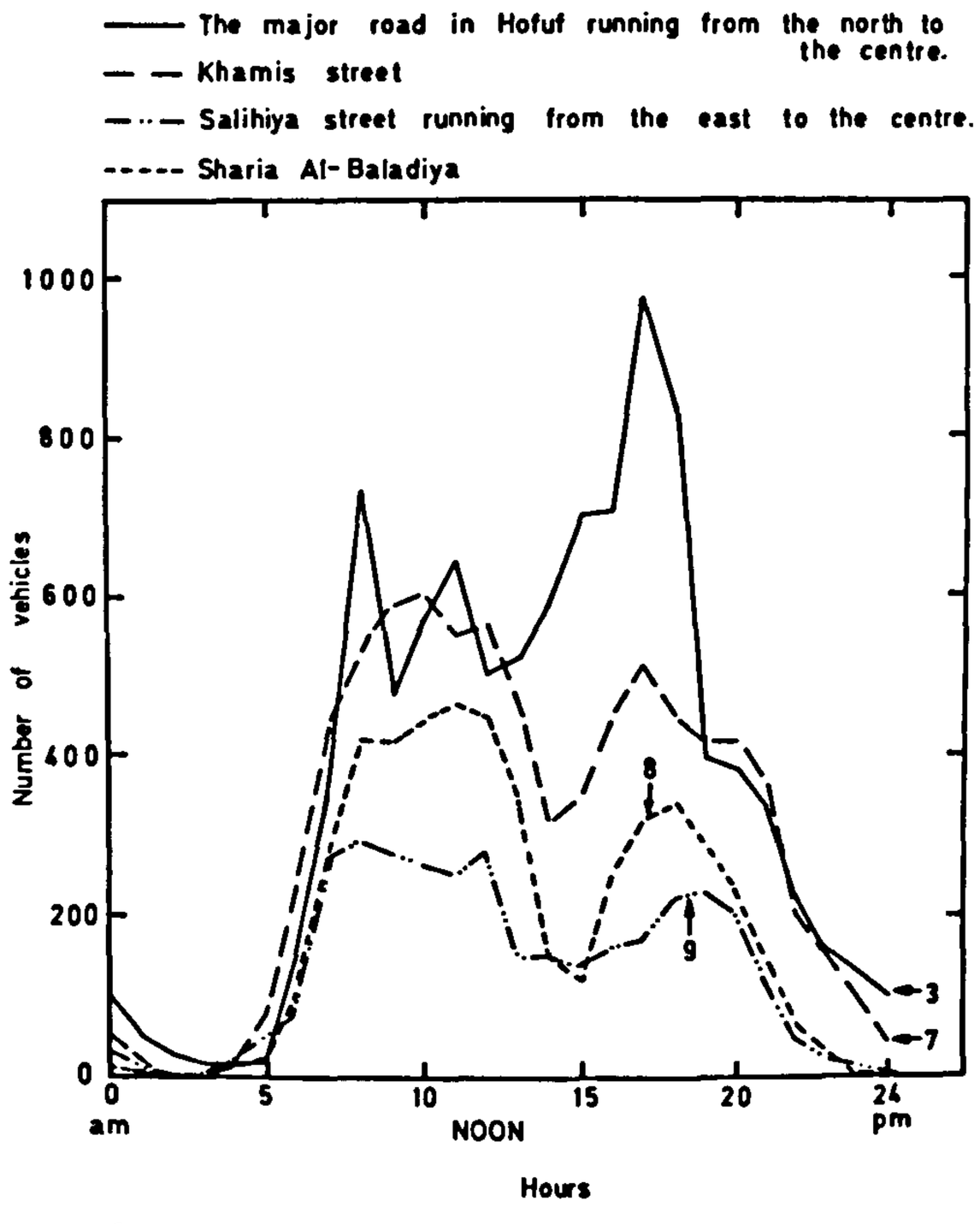


FIG. 8-8. Changing traffic in the centre of Hafuf. (1973)

Hofuf - the average number of vehicles flowing within one hour on the major road from Mubarraz City to Hofuf city centre was 950. The highest number was 1000 at 5pm and in the centre of Hofuf, the average number was around 500, the maximum being 850, between 8-10pm and the minimum after midnight when only 2 vehicles passed at 1am[7](Fig.8.8.).

6. Parking

There are no special parking areas in the cities and towns of the Eastern Province, with the exception of Dhahran, where American-type provision is made for a dominantly expatriate population. The busy central areas of these cities face an acute parking problem caused by inadequate provision of parking areas, and it is essential to create parking facilities in these areas near the centres of Dammam and Al-Khobar which have not yet been developed. At present parking facilities are generally better in the new wide streets, where parking strips are provided along the curbs, i.e.in Saud Street and others in Dammam. Parking is normally allowed on one side, as in Khalid Street in Al-Khobar. This system of parking somewhat reduces the width of road available for traffic lanes. The need for parking facilities is very great in the cities especially during the afternoon peak hours between 4-9pm, as parking on the main streets during these hours is practically impossible. The number of parking spaces required for business, shopping and social trips is approximately 2840 in Dammam, 3920 in Al-Khobar and 745 in Hofuf, preferably within easy reach of the city centres.[8]

The differences between each settlement either in street pattern or in traffic flow indicate the differences in general function and the spatial distribution of specialised functions. For example, not only does the traffic flow have much longer peaks and troughs at Dammam and Al-Khobar than at Hofuf, but there are time variations in maximum traffic flow within the areas of each of the first two towns. Part of these latter variations are bound up with the locational pattern of those urban functions which generate or attract traffic the most important of which functions are industry and commerce.

TABLE 8.1

COMPARISON OF NUMBERS AND TYPES OF COMMERCIAL FIRMS (1971)

City	Number of Firms	Number of Employees	Independent Establishments	Headquarter Establishments	Branch Establishments
Hofuf	2249	3764	2019	67	167
Qatif	849	1197	775	29	48
Dammam	3074	10399	2496	150	428
Al-Khobar	1872	7782	1486	108	278
Dhahran	110	1140	93	2	15

Source: Ministry of Finance, Central Department of Statistics

Table 8.1 gives a preliminary indication of the relative status of the five towns in terms of number of commercial firms of different sixes. Dammam and Al-Khobar are already pre-eminent in business employment and in the number of headquarters of firms located there. The average size of the large number of firms established in Hofuf is low (as is also true of Qatif) compared with the newer towns. Further analysis is deferred to the individual case-studies and the conclusion.

Commercial activity in the form of retail trade is frequently used in spatial studies of urban morphology and also as a criterion for determining the relative hierarchial status of settlements and their spatial inter-relationships. In each of the case-study settlements field surveys were made of the distribution of shops and of the relative numerical importance of retail establishments by category.

In this case and before examining each sample, some further preliminary points must be made.

In many studies of the geography of shopping and of retail trade locations in Europe and North America, it has been possible to distinguish between different categories of shops according to the goods sold.* Analysis of this type is possible where retail trade is separated from manufacturing and where specialisation in the type of goods sold is normal. In this study of the settlements of eastern Saudi Arabia we only have relatively detailed

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* See for example "Customer Movement and Shopping Centre Structure" D.Thorpe and G.A.Nader, Regional Studies, Vol.1, 1967.

information for the case study towns but the sample surveys carried out illustrate the general characteristics of retail trade in the Eastern Province (since the case-study includes almost the major settlements) and the specific characteristics of retail trade in each of the main settlements concerned. The general notes which follow apply to all the town case studies and each town's main characteristics are noted in turn in the particular chapters.

The first point is that Hofuf and the much smaller Qatif developed in the days of traditional Middle Eastern commercial arrangements, in which the suq was the dominant element. For some types of goods the town, and within it the suq, was important as having concentrations of artisans who also sold their own products, e.g.tent-makers, tailors and metal-smiths. In Saudi Arabia most craft artisan groups are linked by kinship and the concentrations are family and kinship based as well as trade-based (see also H.Bowen-Jones, Urbanisation and Economic Development in "The Exploding City" 1972.)[9] For those the 'shop' was also the workshop and residence, and within the suq area particular craftsmen/retailers would often group together in one locality. Sales of food would be differentiated between fresh vegetables and fruit, much of which was sometimes sold in areas separate from the main suq, and other foods such as grain, spices, salt etc, generally sold in the suq; in each case retailing was separate from production. In the traditional towns of the Eastern Province however there would rarely be much sale of 'consumer durables'; furniture was made by carpenters and other high cost items such as jewellery would be craft products sold in the main suq.

Secondly, during the last twenty to thirty years, both the older and newer towns suddenly became the commercial centres for a population whose cash income suddenly increased very greatly and which continues to grow. The new demands created an immense pull for imports and the traditional suq became overwehlmed by the purchase and sale of goods of all kinds, foodstuffs, furniture, electrical appliances, clothing etc, brought in from other countries. Now, therefore, especially in the older towns, there

is still some demand for traditional commodities made or channelled in traditional ways as well as for the new range of goods. The merchants' response varied from individual to individual, but in many cases it was to add a new range of products to those already sold. The general goods shop has thus been a profitable development covering a large range of goods from transistor radios to hurricane lamps, from cloth lengths to tins of fruit juice. In the newer towns however, depending on the social and economic composition of the population, specialisation in types of goods appeared more quickly. The general goods shop has not disappeared but there has been an increase in the number of specialised shops.

Lastly, as a general point, the change in goods purchased and sold, in volume and type, had locational effects which varied from place to place. The oldest towns first absorbed the new trade into the traditional suq areas which then spilled over into neighbouring areas. Some goods and services appeared on the outskirts where land was available, eg furniture showrooms and car repair shops. Now new plans for shopping areas to meet new requirements have to be designed. In the newer towns however, eg Al-Khobar, the plans prepared in the 1950s took some of the new shopping needs into account and shopping streets, rather than suq areas, are normal.

In this and the other case studies these general points have to be remembered in considering what are still rapidly changing situations. In particular the following remarks on shop classification should be noted:

Group 1: Wholesale foodshops

Group 2: Retail Foodshops - normally excluding Group 3, traditional foodstuffs, eg grains.

Group 3: Groceries - normally non-fresh items and mainly imported dried, canned and frozen products, eg canned fruit, tea, sugar.
Fruit and vegetables - fresh, locally produced and imported.
Dates - traditional outlets
Bakers - producers and retailers

Group 4: Retail apparel
Tailors - craftsmen and retailers

Group 5: Consumer durables - retail

Group 6: Expensive consumer goods

Jewellers and watches - retail

Goldsmiths - craftsmen and retailers

Group 7: Other consumer goods - chemists, medical tools, books, records and toys.

Group 8: Social and entertainment commercial services

Group 9: Other commercial services.

Group 10: Other retail - hardware, ships tools, motor spares, and gas dealers.

Group 11: Car showrooms and warehouses for miscellaneous goods.

Group 12. Undifferentiated retail, ranging from 'corner shop' to small 'supermarket'.

In each case-study a brief analysis is made using this categorisation, of retail trade and a comparision of retail trade in the five towns presented at the end of this chapter. Similarly the presence of various social service facilities e.g.schools and hospitals, is tabulated in each case-study and a ranking comparison presented at the end oi the chapter.

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A. HOFUF

Many years ago, prior to the discovery of oil, Hofuf was the principal and only large town in Eastern Saudi Arabia, situtated at Al-Hasa Oasis and about 75Km. from the Gulf Coast.

Al-Hasa Oasis is famous for its great date gardens and vast cultivated areas, which extend for 34 Kms from Al-Jidaida in the north to Al-Taraf in the south, with an approximate width of some 20Kms. (see Fig.3.3). In the Oasis lie the towns of Hofuf and Mobarraz, the urban centres of Al-Hasa for many centuries, together with 58 villages.Al-Hasa Oasis, together with Qatif Oasis long gave the Eastern Province pre-eminence in Arabia for date and vegetable gardens.

In anceint times, dates were the mainstay of dwellers in the oasis of Al-Hasa, both for food and commerce, and also provided the chief income for the whole region. Trade was largely agricultural and pastoral products were exported outside the region; Hofuf became the main commercial, urban and administrative centre of the oasis and the Eastern Province as a whole. Conditions in Hofuf and its regional status have, however, been fundamentally changed since the beginning of oil operations in the province, especially since 1944, due to the Abqaiq Oil Field discovery and the growth of the oil industry on a large scale.

Location and Site

Hofuf is situated in the south western part of the oasis on a slight eminence 158.6 m.A.S.L. in the south east quadrant, from which it slopes down to the west, north and north east; the general altitude of the site surface is about 150 m.A.S.L.[1]

Historical Outline

Hofuf is a town of considerable age, it was the citadel town of the celebrated Bani Kindi and Abd al-Kais, dating back to 570 AD, and it then went under the name of Hajar,[2] celebrated as a trade centre and market. The trade route caravans all called at Hajar on the journey to and from Hijaz, Southern Arabia, Syria, Iraq and India.[3] During the tenth century, 300 HD[4], Hofuf was built on the ruins of the old town of

Hajar, on the present site, by Abu Tahir Al-Carmathia, the leader of the Carmathians. Since that date, Hofuf has been conquered many times by the Arab tribes; during tho early sixteenth century, the oasis of Al-Hasa was under Portuguese rule.[5] From 1550 to 1673 it was ruled by the Turks and then by the Baini-Khalid tribe up to 1797. At the end of the eighteenth century, Al-Hasa and Qatif were ruled by Al-Saud the First,[6] for more than twenty-five years. During the mid-nineteenth century Al-Hasa and Qatif oases remained uncontrolled during a period of power vacuum, but in 1871[7] Al-Hasa and Qatif again came under Turkish rule and remained so until 1914, when the present government of Al-Saud took over. From earliest times, Hofuf was the administrative centre of Al-Hasa region, and the prize and regional headquarters of all territorially successful groups. In February 1953, when the governor of the province moved his headquarters from Hofuf to Dammam, due to the growth of the oil industry there and establishment of the new urban centre, Hofuf lost its traditional pre-eminence.

The Population and its Growth

Formerly, the people of Al-Hasa Oasis were partly sedentary, partly nomadic. During the winter and spring, the nomads and their animals were dispersed over the desert rangeland, whilst in the summer they settled near the water in the oasis.

At present, there are fewer nomadic people in the oasis than ever before; most of them have settled down in the towns, working in the oil industry or in the private sector. Many Bedouins and peasants, attracted by the opportunity of earning a better living, have turned to employment with Aramco and in the coastal towns of Dammam and Al-Khobar. The original inhabitants of Hofuf were from the Bani Khalid, the main tribal group of Al-Hasa which ruled the Al-Hasa region in the second half of the eighteenth century. The next most

important tribes to live in Al-Hofuf were the Bani Hajir and the Mutair tribes. · There were also other tribes living in or around the town and villages, such as the Al-Murrah, Aijman and Ataiba tribes.

At present, it is difficult to enumerate or even estimate the strength of the tribes who live in Hofuf, because under the new system of government and in the changing society of the urban areas, tribal identity is no longer regarded as important. In all the personal surveys it was clear that compared with the villages and in the desert area, people first think of themselves as inhabitants of Hofuf and only secondarily as members of tribal kinship groups, whereas outside Hofuf the reverse is true.

Hofuf, as with the rest of the Eastern Province has never had a census, but some estimates have been prepared concerning the population size (Table 8.2).

TABLE 8.2

ESTIMATED POPULATION OF HOFUF FOR SELECTED YEARS

Population	Year	Reference
23,000 or 24,000	1862	Palgrave, W.,"Narrative of the years journey through Central and Eastern Arabia",Vol.II.p.149
20,000	1905	Holgarth,D.G.,"The Penetration of Arabia,p.234
25,000	1908	Lorimer,"Gazeteer of the Persian Gulf,Oman and Central Arabia", Vol.II.A, p.664
30,000	1924	Mackie,"Hasa": "The Arabian Oasis",G.J.Vol.63,p.195
25,000 or 30,000	1949	Dickson, H.R.P.,"The Arab of the Desert", map.
60,000	1952	Vidal, "The Al-Hasa Oasis", p.17
80,000	1962	Albert N.Abdo, "Marketing Channels, Practices and Facilities", p.17
60,000	1971	M.E.E.D.,"Saudi Arabian Consumer Market has a great potential", Weekly Report, Vol.15:16, April 16 1971, p.399

In addition, I have attempted to provide an estimate for the population of the cities selected for the study by counting the number of houses from the aerial photographs, for several years in each city. The estimated average, on the basis of preliminary sampling was taken at five persons per house, with estimates for buildings containing flats of three storeys per building, and four flats per floor. The possible margin of error may be considerable but it is probable that for comparative purposos it is of the same order for all the case-study settlements.

The population of Hofuf estimated from the aerial photographs was 50,000 in 1935; 55,000 in 1951; 63,000 in 1960 and 78,000 in 1970 (see Table 8.3.)

TABLE 8.3
POPULATION ESTIMATED FROM AERIAL PHOTOGRAPHS OF HOFUF

Year	Population	Percentage Increase
1935	50,000	-
1951	55,000	10.0%
1960	63,000	14.5%
1970	78,000	23.8%

Source: Aerial photograph analysis (personal estimation).

Population increase in Hofuf was very small during the sixteen years from 1935 to 1951 (10.0%), during the initial growth of the development of the oil industry, and many people moved to work in the new industries in other parts of the province. During the nine years from 1951 to 1960, which might be called the second stage of growth of the oil industry, the increase was about 14.5%, because in this period the size of businesses increased in the town, partly associated with the growth of the government administration up to 1953 and private sector activity. The largest increase was during the period from 1960 to 1970, about 23.9%, this being due to the many changes taking place during this period:

1. The continuation of the widespread effects of regional growth, and specifically the centralisation at Hofuf of offices and residents attached to new projects as the drainage and irrigation of Al-Hasa, the sand stabilisation scheme and other projects for agricultural improvement.

2. The creation of a few new industries, such as the very important cement factory.

3. The increase in the number of Aramco employees residing in Hofuf, due to the home ownership programme instituted by the company (see Chapter 8 section C).

These three factors contributed greatly to the growth in population and business in Hofuf.

The Morphology of Hofuf

Hofuf extends at present from north to south some 3,600 metres with an average width from east to west of 1,300 metres. The built up areas in the north-eastern and south-western zones are less densely developed residentially than the centre or the old town of Hofuf.

A. Urban Region

During the 19th century and earlier Hofuf was the only really habitable and important inland region in Al-Hasa. Caravans halted there on the long journey from Uqair, the ancient port of Al-Hasa on the Gulf, Salmah in Qatar, Oman and also from Qatif and Jubail ports further north [8], on their way to Najid and Hijaz and to the Mediterranean.

W.G. Palgrave described Hofuf town in 1862 as: "the general form of the town was that of a large oval shape, and constituted three Quarters of Al-Kut, Al-Rifayiah and Al-Naathil. The public square, an oblong space of about 82 metres in length by 60 metres wide". [9] The town was surrounded by a wall built of rough stone and containing several fortified gates, and it was only via these gates that entrance or exit to the town was possible. At this time there were also small satellite villages near Hofuf, Al-Fadhilia to the north-east, Salihiya east, and Al-Rigaigah south-west of the town.

In 1905, Lorimer described it as follows: "the space covered by the buildings in Hofuf was described as oblong, with a length from north to south of 3,413 m. and a width of 804 m. The land to the south-east of the town is wasteland, and quickly merges into the desert. On the other three sides are cultivated areas and date gardens, most dense on the northern and eastern sides, and approaching close to the walls of the town". [10]

From an aerial oblique photograph of 1935 it has been possible to reconstruct a map of Hofuf as it was at that time, from which we can see that south-east of Hofuf and the northern part of Al-Salihiya satellite had become joined, and the town wall being the only separation between them (Fig.8.9). Hofuf has since expanded to include true suburbs after the removal, in 1947, of the inner and outer walls and the new expansion described below.

The Quarters of the City:

At present, and since 1970, Hofuf consists of eleven Quarters, as against the three Quarters of Palgrave, divided into three categories, from the point of view of development:

1. The Quarters of the old town; "Fariq", Al-Kut, Al-Naathil, northern and southern Al-Rifaah.

2. The 'suburb' Quarters have their origins as satellite nucleii, inhabited more or less permanently outside but near the old urban centres by Bedu and farmers; these have since grown and coalesced with the old urban centre to form Quarters of the present settlement: Al-Fadhiliah, Al-Salihiya, Al-Thulathiya and Al-Rigaiga.

3. The absolutely new Quarters, called 'Hillat'; Bin Mazroa, Al-Mansour, Al-Dawasir and Al-Murrah. These had no previous settlement of any kind and occupy previously farmed or wasteland.

First Category

1. Al-Kut: This Quarter is situated in the north-west of the town. Formerly it was the main administrative centre and the most important site. Al-Kut was surrounded by a deep trench and stone walls, with stout bastions with a distance of about 123 metres between them. Even inside the Kut there was yet another walled enclosure to serve as a third and final place of refuge if the town's outer walls were carried.[11] The main tower, called "Kut al-Ilizar" on the northern

FIG. 8.9. HOFUF IN 1935.

side of al-Kut, was small and in the form of a strong fortress keep. The main gate, situated at the middle of the eastern wall of Al-Kut, was well fortified.

The general shape of the old Al-Kut was almost square; at present it contains the ruins of Ibrahim Palace, and mosque, constructed almost two hundred years ago, with its dome forming by far the most striking piece of architecture in Al-Hofuf. At present, the palace is surrounded by its old fortified 25 foot wall. To the west of the palace the park is lozenge-shaped, surrounded by an open space in which there was, at one time, a stable in charge of the governor. On the north-west of the park is Qasir Al-Abiad, a fortified square-structured castle; to the west of Qasir, Al-Abiad and the north of Qasir Ibrahim, there are two schools and to the south of Qasir Ibrahim there are the al-Amarah office, "Emirate" and Hofuf Courthouse. Nowadays, Al-Kut has lost its past significance as the administrative centre of Hofuf, in the same way that Hofuf ceased being the administrative town of the Eastern Province.

2. Al-Naathil: South of Al-Kut, this Quarter more than one hundred years ago was the largest Quarter in Hofuf, making up about half the town in that time.[12] Now it comprises less than 25% of the town. Al-Naathil consists of the Municipal Offices, a hospital, two schools and a covered market with a variety of goods.

3. Al-Rifaah: This Quarter is divided into two halves, the northern and the southern. The northern half is to the east of Al-Kut and consists of a hospital, a government suq and a date market. Southern Al-Rifaah lies to the east of Al-Naathil quarter and contains date gardens and also goldsmiths suq in the north-west.

Second Category

4. Al-Salihiya: Extending to the east of al-Rifaah, this is a

relatively recent development, the first house having been built in 1324 AH (1904 AD).[13] Al-Salihiya was the first expansion of the city of Hofuf to the east, and contained Qasir Bizzan and school in the north-eastern part.

5. Al-Thulathiya: south of Al-Naathil and Rifaah Quarters, this Quarter was a suburb, with date gardens but the new expansion after 1950 joined it to the main town at the southern boundary of old Hofuf. The date gardens in the quarter are separate from the main residential units of the town.

6. Al-Rigaigah: this Quarter lies to the south-west of the city; almost wholly new, its growth increased after 1950 as an extension of Hofuf south-westward in a large expansion area taking in the rich site of Al-Rigaigah, an old Bedouin camp. Al-Rigaigah has date gardens in the east and schools in the north, and the Royal Palace to the west of the Quarter. There are many open spaces between Al-Rigaigah and the main residential area.

7. Al-Fadhiliah: To the north-east of the city, another almost new expansion into the main date gardens of the eastern oasis and which had in 1951 only one or two houses. This Quarter has the power station of Al-Hasa and a school within its area.

Third Category of Quarters

These four Quarters are known in Arabic as Hilla or Al-Mahalla or Fariq, by the people in the Province; there is no functional difference between Fariq and Mahalla or Hilla. The first two, Hilla Al-Mansour and HillaAl-Bin Mazroa are both to the west; and connected to the main town. At Hilla Al-Mansour is the old fortified building of "Qasir Khizam", the oasis which was the military residence in Turkish times.

The other two Quarters, Hilla al-Damasis and Hilla Al-Murrah to the east of Al-Damasir, have grown up as separate small villages, close to the southern edge of the date gardens and divided by an open space from Al-Thulathinah Quarter further north.

The general growth of Al-Hofuf has extended in every direction except to the north-west where the cemetery is situated. The date gardens, which formerly surrounded the town, particularly from the south and south-west, have shrunk in size year after year as the town was extended. In Hofuf, as in Qatif, directly after 1950 some of the farmers burned or cut their plants and palms, and divided their land into smaller areas for the new urban area of the towns, preferring to sell their land rather than to cultivate it. At the same time, there was waste sandy land towards the east and south at Al-Silihiya which remained unused. If the initial expansion had been towards these waste areas, the farm lands and date gardens could have been preserved for the pleasure of the towns people, and more important, to preserve the balance of agricultural income. The areas of new growth were built to modern designs, with modern materials such as cement and bricks, whilst nearby most of the old Quarters have remained intact with their mud buildings and narrow streets.

The new and renovated buildings are also situated in what were formerly open or green areas in the towns, now infilled. For example, a large area of date gardens lay between the south of Al-Kut and north of Al-Naathil Quarters; this at present is occupied by the hospital and the new covered market for clothes, shoes and other goods.

B. Urban Zone

1. The Core

A great variety of activities are concentrated in the urban centre and in Hofuf activities were, and are, far more varied than in

Qatif. Locally, Hofuf was closely linked with Mubarraz, three kilometres to the north; it also serves the agricultural villages selling their produce to the dealers' agents, from where it is distributed to the oil towns. The economic activity in the centre of Hofuf has changed with the advent of more modern commodities, and the extent of the trade, during the oil period, has now greatly enlarged. Formerly, the day of the suq of Al-Khamis was a very important day of the week. About 10,000 people congregated in the broad market streets,[14] whereas on the other days of the week trade was smaller. At present the suq of Al-Khamis is still held every Thursday, but not in the main street of Hofuf as it was previously. It has been moved to the east outside Hofuf because the face of the city has changed, and its commercial activity has increased rapidly. The crowded Suq Al-Khamis created traffic problems in the city centre, particularly in the main street (Suq Al-Khamis Street). Shops on either side of the street retail a large variety of goods and in the east of the street there was a covered market (known as Al-Qaysariyia or Suq Al-Hukuma - government market) which sold seeds, clothes and other goods. The goldsmiths and jewellers market was situated further south, near the Municipal Square.

2. The Integuments

The demolition of the walls on the outskirts of the old town gave Al-Hofuf a new character, and changed the face of the urban city. Recent urban expansion has come in two forms - outward extension and internal re-organisation, and marks the modernisation of the city. Most of the old inner town walls have been torn down to permit the widening of the streets and the development of open spaces with new wider streets.

Development of Hofuf's Urban Structure

The discovery of oil in the region had its effect ten years later on the position of Hofuf. Many towns grew up in the Province, such as Dammam, Al-Khobar, Dhahran and other centres. Dammam, in 1953, took the place of Hofuf as the administrative centre of the Eastern Province, while Hofuf kept its position as the administrative centre of Al-Hasa Oasis.

The development in the structure of the urban area began about 1904[15] when the first house of the new expansion was built in Al-Salihiya, outside the eastern wall of the town. Salihiya had been slowly growing towards Hofuf, and the development of the new extension was in small groups of houses away from the main blocks of the town, to the south-west and the north-east of Hofuf. This came about after the demolition of the walls. In 1951, the buildings of Hofuf in general covered an area of about 370 acres (See Fig.8.10photo 1951). By 1960 the expansion had increased, the built up area enlarged by about 24.3% to 460 acres (See Fig.8.11photo 1960). The period from 1960 to 1970 and 1973 saw great developments in the growth of Hofuf, as it expanded everywhere except to the north-west, the south-west expansion being particularly large - an area of about 250 acres. The built up area of the whole town of Hofuf is now approximately 1,010 acres, an increase of 114.9% over the 1960 figure (See Table 8.4 and Fig.8.12photo 1970 and Fig.8.13 photo 1973).

TABLE 8.4
GROWTH SEQUENCE IN HOFUF: 1935-1970 (in acres)

Year	Acres	Percentage Increase
1935	320	-
1951	370	15.6%
1960	460	24.3%
1970	1,010	114.9%

Source: Aerial photograph.

FIG.8.10. HOFUF IN 1951.

FIG.8.11. HOFUF IN 1960.

FIG.8.12. HOFUF IN 1970.

FIG.8.13. HOFUF IN 1973.

In the new expansion, the houses tended to group together, with large or small open spaces between the building groups, while the houses of the old town remain very close together.

C. Planned and Unplanned Areas

1. The Planned Residential Areas

From 1960 onwards, the government began to carry out a programme of widening the streets in most of the towns of the Eastern Province, by modernising them and laying asphalt footpaths. Hofuf was included in this plan and the first step was to modernise and widen existing streets running through the old quarters. The second step was the new urban expansion outside Hofuf in the date gardens and the cultivated areas. The planned areas consisted of the new quarters of Al-Fadhiliah, Hillal Bin Mazrou, Al-Mansour and Al-Rigaigah.

2. Unplanned Residential Area

The old three Quarters of Al-Kut, Al-Naathil and Al-Rifaah were unplanned areas; the houses were contiguous, with only narrow streets and lanes between them. The genesis and the initial growth of those parts brought uncontrolled development; as the people moved in, they took over any vacant land and built their home on land of their own choice, near the houses of other residents - this kind of genesis and initial growth occurred in almost every part of Arabia. The people settled down and constructed shelters and fences of locally available materials, separated from the next house only by a narrow irregular footpath. Broad streets were unknown in those early times, and the people saw no reason to bother to construct them.

D. The New Plan - Post 1960

The target of the new plan is direction and control of the extensions of Hofuf, towards what is considered suitable land for future expansion, and covers the whole residential areas; it will

change the face and function of the town. In the first stage of the new plan, many houses were demolished for the purpose of widening the narrow existing streets or even making new streets in the old Quarters. For example, the street running south of Suq Al-Khamis, between Al-Naathil and southern Al-Rifaah, has been widened and developed as the main street, and extended, running south to outside Hofuf city, while the other streets of the old city have been improved in system and situation. At present, the main street from north to the south is about 30 metres wide, the same width as the ring road of Al-Kut north and west of the town, and the road from Al-Rigaigah south. From Suq Street to the third roundabout south, the streets are narrowest, about 20 metres in width. The other secondary streets of the old town are the narrowest of all the main streets, being only 10-20 metres wide. The ring road of Al-Kut Quarter is the broadest street in Hofuf, similar to those planned in the new expansion, with a double width, tree-lined roadway.

The post 1960 plan can be considered under three zone headings:

First: the plans for the inner residential areas of the old quarters (the first category of page 225) remain a patchwork for two reasons:

(a) the available open areas were small and scattered;

(b) the land near the town centre is very expensive, densely populated and greatly in demand.

The sub-division of land and the purpose for which it is used depends entirely on the owners of the land, the town planners having very little control in the absence of a major municipal land purchase policy.

Second: in the new expansion of the residential areas (categories 2 of page 226 and 3 of page 227) the case is very different. The block and subdivision layouts are usually controlled by the town planners, each block being from 50-80 metres long by 40 metres wide, with sub-

divisions from 10-25 metres long and 7-10 metres wide.[16] In this phase (see pp.233-34) the planning approach has been usually grid geometrical.

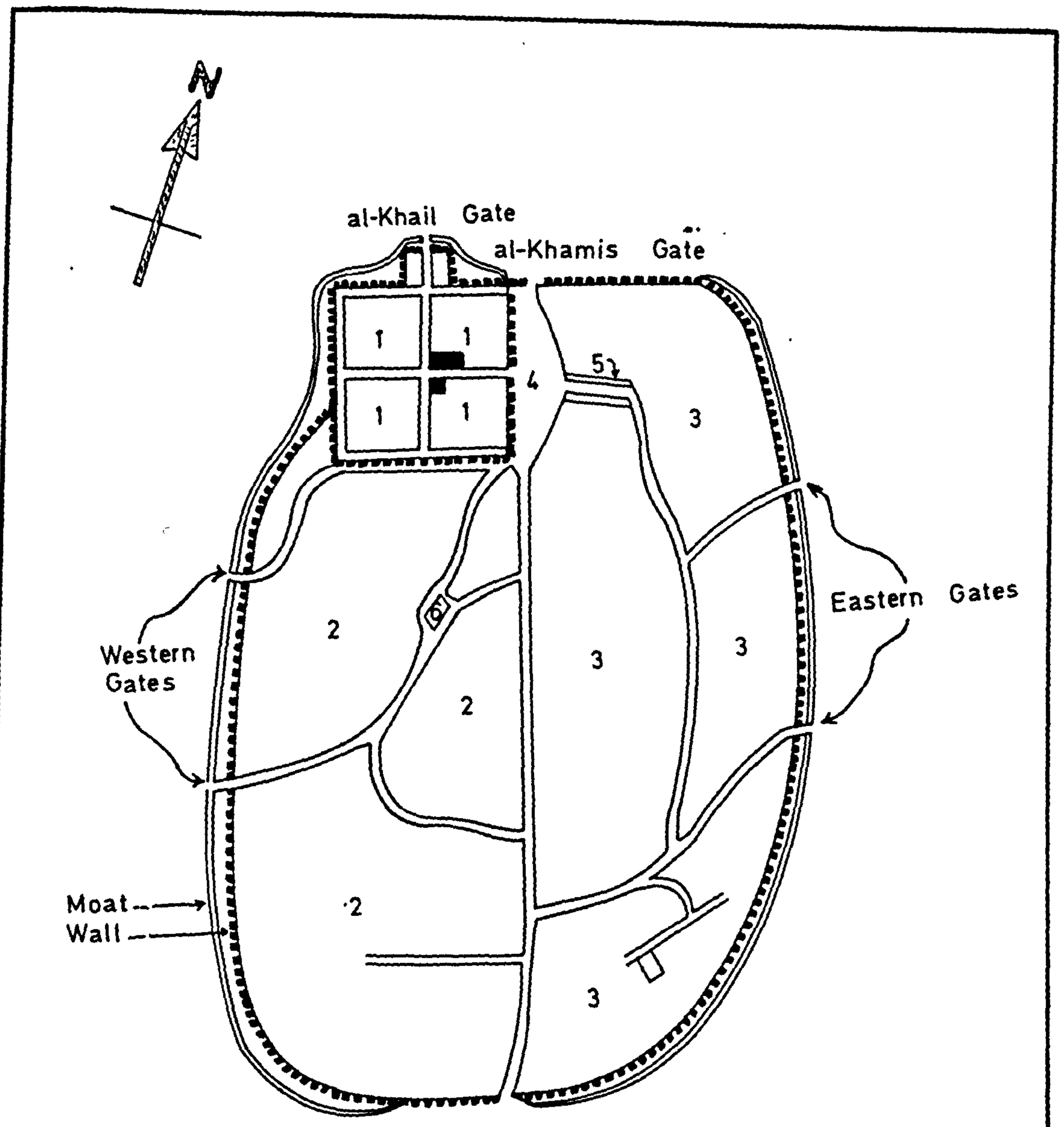
Third: the section of the new plan for future expansion is laid out at the north-east of Al-Fadhila, west of the Hilla Al-Mansour and Bin Mazr.ou and in Al-Rigaigah areas. This plan considers all the facilities of the town, such as schools, parks and public facilities and represents an advance from layout planning in two dimensions to community and functional planning.

Planned Areas of Residential Expansion

As mentioned earlier, at this stage Hofuf was the oldest town in the Eastern Province, with only three old Quarters of areas A, B and C. The city had not been expanded outside the walls which surrounded Hofuf. In 1862 Palgrave visited Hofuf, and drew his sketch plan (See Fig.8.14). This was the first and earliest map of Hofuf. Since that time, the residential areas of the town did not increase until the early half of the 20th century; the first expansion was in area D to the east of area C, and this grew up as a separate expansion. (see Fig.8.15)

The greatest development in the expansion of the residential area was during the beginning of the second half of the 20th century. This expansion was to the north-east and south-west of the city, through the date garden areas which were very close to the old city.

The planned area of the first expansion was similar to those of the old quarters. The houses were grouped in the same system of planning. The houses in areas A, B, C and D were much denser than those of the recent expansion in areas E, F, G and H. The recent expansion was designed in modern planned areas, particularly those of areas E and H to the south-west of Hofuf. Area H was yet another



1 al-Kut qu.
2 al Na'athil qu.
3 al Rifa'ah qu.
4 Suq al-khamis.
5 al Qaisariya.
6 Mosque.

FIG. 8.14 HOFUF IN 1862. (after Palgrave)

FIG. 8.15
THE RESIDENTIAL EXPANSION
IN HOFUF 1904 - 1970

A,B & C. THE OLD CITY

D FIRST EXTENSION PRE OIL

E FIRST EXTENSION AFTER OIL.

E & G SECOND EXT.

H THIRD EXT.

X UNDEVELOPED BUT PLANNED

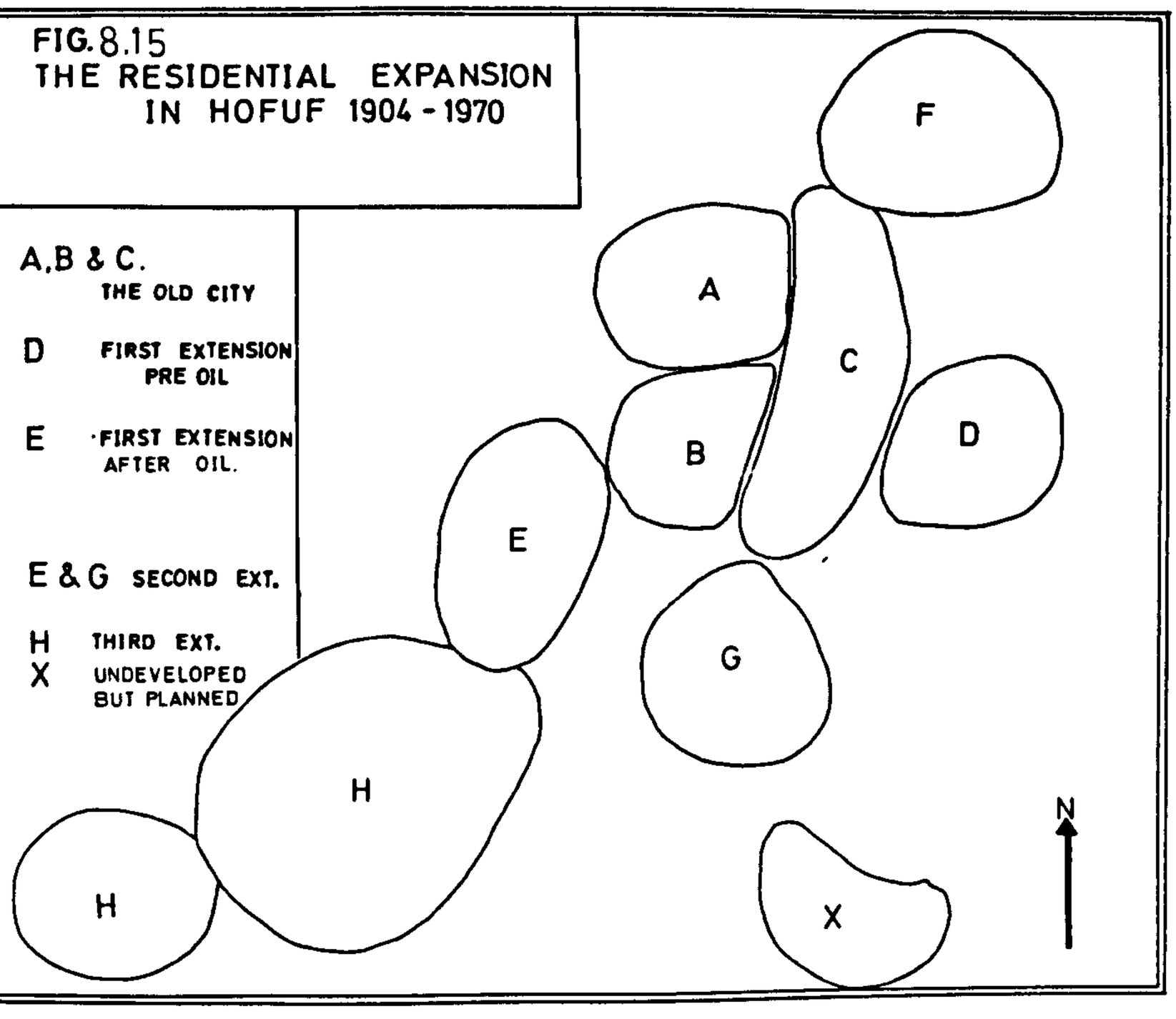


FIG. 8.16
THE SEQUENCE OF THE GROWTH
IN HOFUF 1904 – 1970

OLD CITY

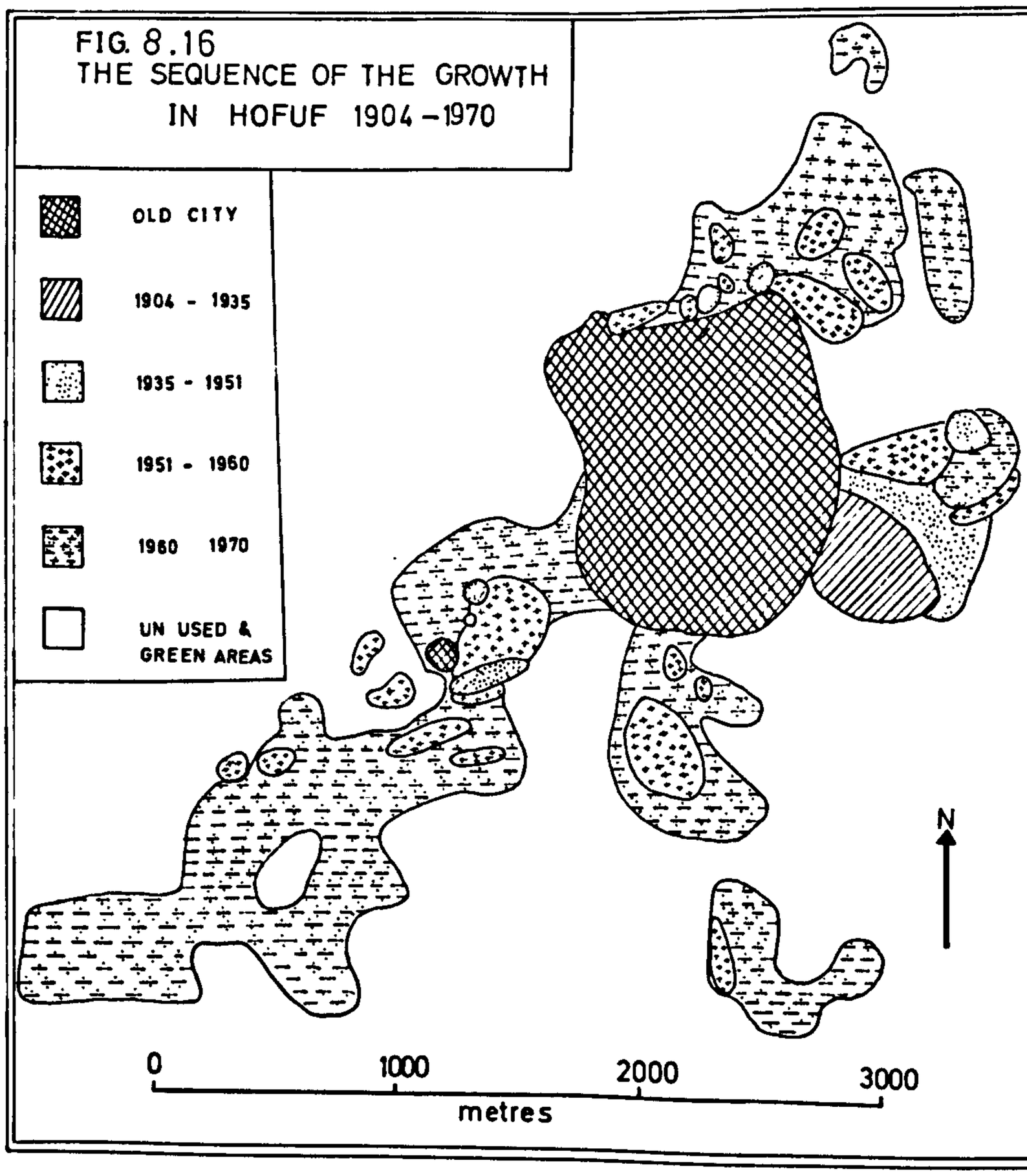
1904 - 1935

1935 - 1951

1951 - 1960

1960 1970

UN USED & GREEN AREAS



bigger extension than areas E and F, and this reflects the expansion trend of the period between 1960 and 1970. Areas E, F and G were markedly different; in general they were much more densely developed, with larger groups of houses. The overall picture of the recent expansion of areas E, G and H in the south and south-west has not yet been completed; each area is almost separated from the others, and they are not, on the whole, joined to the main old residential areas of A, B and C. They are separated by the old date gardens and large open spaces.

Area F in the north-east and area H in the south-west have been planned for yet further expansion in future, and it could be that this will be the third stage of the expansion programme. The first stage was to the east, in the period of the pre-oil era at area D. The second stage was the recent expansion, after the discovery of oil, up to 1970, in areas E, F, G and H (See Fig.8.15); and the third stage of the expansion, commenced after 1970, will tend to develop towards the north-east, in area F and later in the south-west in area H.

The Sequence of Growth (Fig.8.16)

Towards the end of the nineteenth century, Hofuf had not grown outside the three old quarters in areas A, B and C. Area D was the first expansion, the first building being constructed there in 1904. Growth then expanded in this first extra-mural area extending westwards, towards the three older quarters of Hofuf. Growth and development were very slow up to 1935, but there was a little expansion further away from Hofuf (See Fig.8.17., map 1935). During the period 1935 to 1951, area D expanded only towards the east. To the south-west of the city, two small groups of houses were developed in area E, separating the date gardens and the old main housing areas. Also to the north of the city, there developed two small groups of houses on the fringes

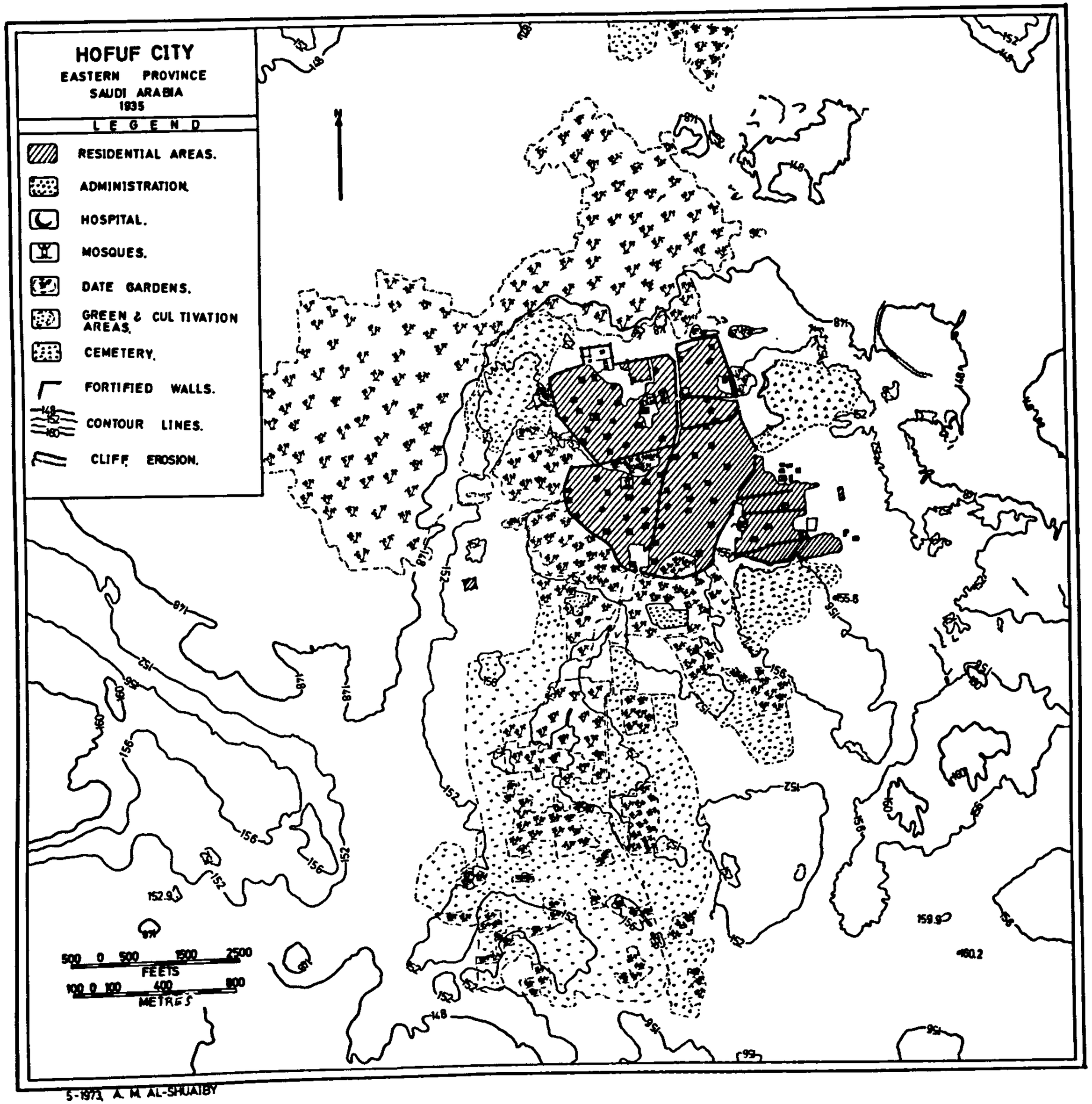


FIG. 8.17 , HOFUF EXPANSION IN 1935.

of area C (see Fig.8.18 map 1951). When we compare the two maps of Hofuf of 1935 and 1951, we see very little difference between them. From 1951 to 1960, area D expanded to the north and the north-east. Area E has grown and expanded to the north and north-east, towards Hofuf, and also large groups of houses had been built at a new area, to the north east of Hofuf, where area F is now situated. To the south of the city, new area G was formed by the development of a small group of houses among the date gardens which by 1960 had become much reduced in area compared to 1951 (see Fig.8.19) map 1960). In comparing the growth in the period before and since 1951, we find much more evidence of expansion after 1951, when two large areas had been developed in addition to the later expansion at the former areas. After 1960 growth developed at a much faster rate than in the previous two periods; the former development areas had been expanded much more in this period than ever before. Area E was extended to the east and joined to the main blocks of the city; area F was extended to the north and north east; the area G was extended to the north and joined the city, and there was great development also to the south; area D was also expanded to the north and east. The lastest growth is found in area H: in this zone development took place after 1960, but this area has now become the largest single zone (see Fig.8.20 map 1970).

When comparing the completed map of 1970 with the map of 1960, there is a very obvious difference in the expansion areas and in the development of the city from 1960 to 1970. In the map of 1970, the city has a new and larger shape. Wide new asphalt roads and streets have changed the face of the town in the new plan. Also in this map it is apparent that the date gardens seem much smaller; some of them seem to have completely disappeared.

The elongation of Hofuf along a S.W.-N.E.axis occurred mainly during the period of unplanned growth and, äccording to local statements this resulted from a general response to existing land use. Thus, the large cemetery to the north-west of old Hofuf, together with an extensive

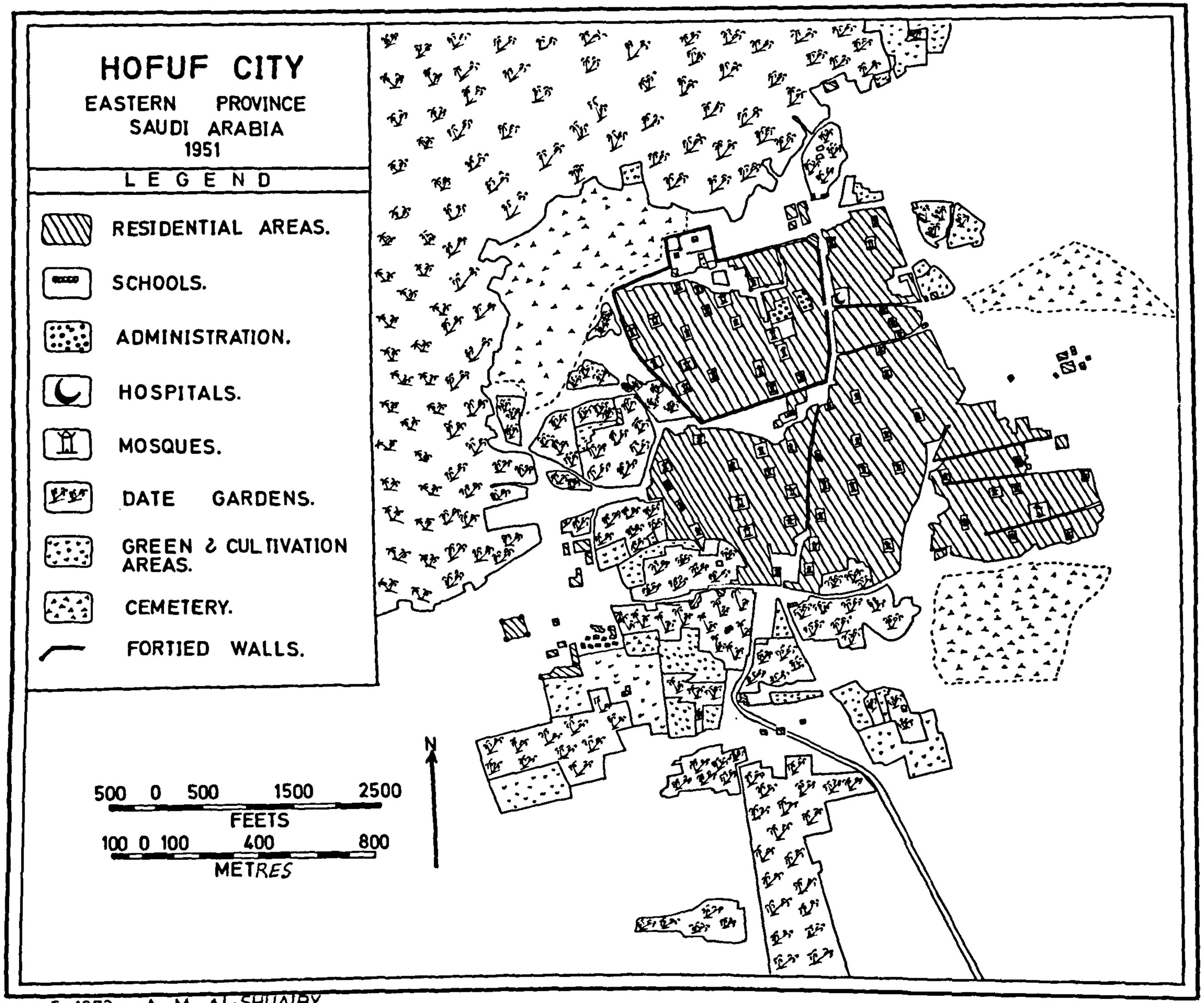


FIG. 8,18. HOFUF EXPANSION IN 1951.

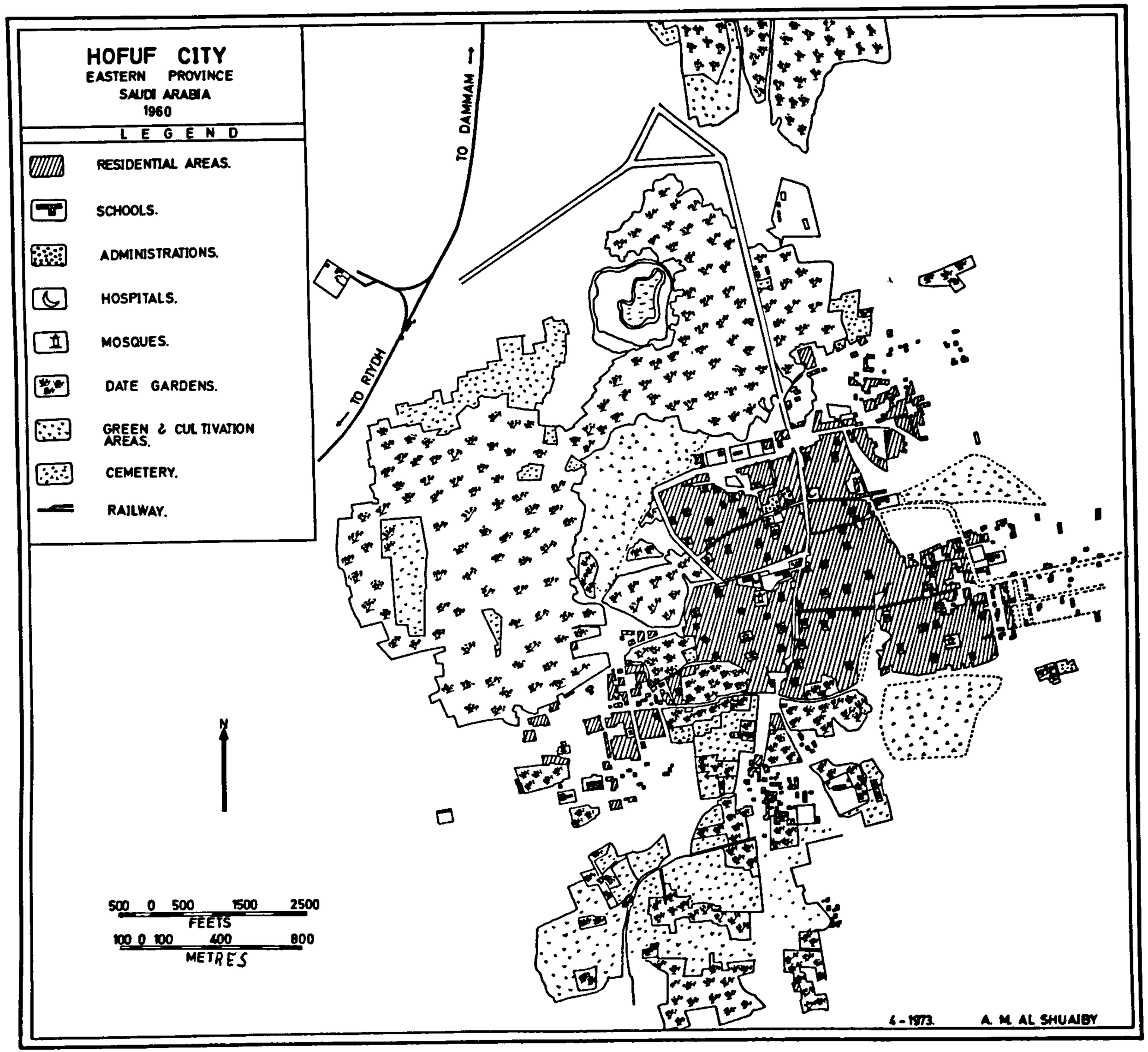


FIG. 8.19, HOFUF EXPANSION IN 1960.

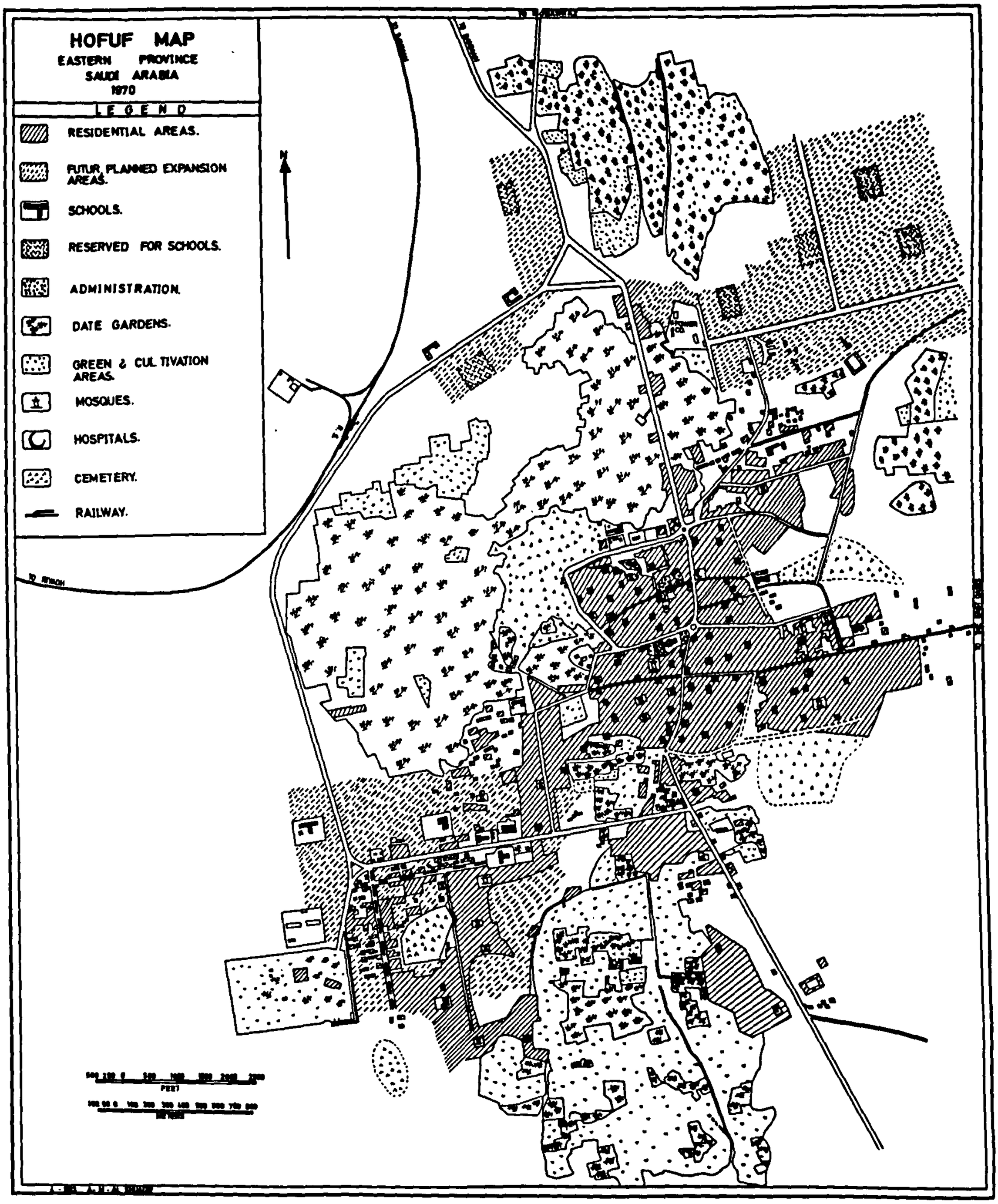


FIG.8.20. HOFUF EXPANSION IN 1970.

belt of date-palms, prevented in the former case and made costly in the latter any urban extension in this direction. To the south, while some urban fringe expansion did proceed, an extensive cultivated area lay in small scale private ownership. At a period when urban expansion was a result of individuals buying land for building, this cultivated area was both more expensive and more difficult to purchase. The areas taken up for new building between 1935 and 1970 were thefore these on which land utilisation was least agriculturally intense and where existing private ownership rights and community use rights(egthe cemetery), were least established or least valued.

Housing

In Hofuf, as in Qatif, the architecture and design many centuries ago had been decided by the famous palm trees. The roofs of the houses were generally flat and constructed of palm trunks. At present, the houses are divided into three types, from the point of view of development.

1. The houses in the old quarters: these were mostly built of stone, mud and limestone, with gypsum mortar. In 1905 Lorimer described the houses of Al-Hofuf as being built of stone and mud, and plastered with gypsum, some of those in Al-Rifaah Quarter being tolerably good, even handsome, with arches incorporated into their architecture.[17] Most were designed with only one storey and the plan of the house (incorporating all the facilities) was left entirely up to the builder or the owner; the general plan of the old houses was similar to those in Qatif town.

The windows were very high, near the roof and narrow enough to ensure the comfort of the occupants, protecting them from the sand and hot winds. At present, many of the old houses have been renovated or replaced by new structures, built of mud or cement materials, but there is very little difference in design, except that the windows of the cement houses are broader, and built nearer the bottom of the walls.

2. Newer Houses and Apartment Blocks: the newer type of house can be found in both the old and the new Quarters, built with brick and cement and having more than one storey. The roofs of the houses are mostly modern in design

and built from cement. The apartment blocks are situated at Hofuf, and are two or three storeys high, but rarely more than three, each floor having from two to four flats; these blocks are built from bricks and cement (see Fig.8.21).

3. The Third Type of Housing: the villas, essentially separate and free-standing units, are situated almost entirely in the areas of new development, and are surrounded by courtyards or gardens. There are very few houses of this type, designed in modern style and almost all have only one floor.

Blocks and bricks are the main materials used in present day construction. In Hofuf, the alteration of buildings and compound walls is quite advanced (see Table 8.5).

TABLE 8.5

BUILDING MATERIALS USED IN HOFUF (1972)

Materials	Construction	Alteration	Compounds	Total	%
Cement	199	-	-	199	9.9
Stone	219	846	25	1080	53.9
Mud	-	-	-	-	
Block & Bricks	309	415	-	724	36.2
Others	-	-	-	-	
TOTALS	727	1251	25	2003	100.0

Source: Ministry of Finance,Central Department of Statistics

Streets

The city of Hofuf has many broad streets, the most important being Suq Al-Khamis, which separates the town into two halves, east and west. This street continues running north/south and becomes the southern exit road. The other main street runs from west to east and separates the town, north and south, thus making a cross with Suq Al-Khamis in the shopping centre. Municipal Street runs west and south to the new Quarters of Hillal Bin Mazrou, Al-Mansour and Al-Rigaigah and also extends to become the road to the railway station. These central main streets are aligned purely for local internal urban functions and have not been laid out to serve arterial needs, thus they do not operate well either for through traffic to and from the west or to the railway station which is situated in the north-west. There is, therefore, a discrepancy between the internal network, even of the

FIG.8.21. OLD FORT AND MOSQUE OF AL-KUT AND THE NEW HOUSES IN HOFUF.

new streets and the external road communication requirements. The streets of Hofuf are generally made from asphalt, and have street lighting and paved footpaths (see Streets, Chapter 8, Introduction).

The Commercial Activities

In the first half of the twentieth century, the centre of commerce in Hofuf was much more centrally located than at present, but only from the point of location and of the nature of goods offered for sale which were more limited.

In 1905, Lorimer described Hofuf as "the chief market of Al-Hasa Oasis and surrounding countries, as well as a centrepoint of the foreign trade of Najid."[18] Also, Hofuf had the most important date market of the Province, exporting dates outside the region of Al-Hasa. The following table (Table 8.6) shows the volume of dates exported to the surrounding countries around 1905.[19]

TABLE 8.6

THE VOLUME OF DATES EXPORTED IN 1905

Quantity (tons)	Disposal	Comments
3,000	Exported to Jeddah, via Uqair Port and Bahrain	The passage from Qatar to Basrah was by saling boat; on this route there was a saving in shipping dues.
1,000	Exported to Jeddah, via Bahrain	-do-
5,000	Exported to Bahrain	For local consumption in Bahrain
2,000	Exported to Qatar	For local consumption in Qatar
40,000	Locally consumed in Al-Hasa, sold to Bedouins or expored overland to Najid, Kuwait, etc.	For local consumption

Source: Lorimer, 1905

The dates exported from Al-Hasa did not include boiled dates, as did those from Qatif. A comparison of the exports of the two oases for 1905 shows that Al-Hasa exported more dates (about 155%). 1938 saw a general change in the quality of production and exporting in the Eastern Province, and also in 1953 a change in the loss of the status by Hofuf as the commercial and administrative centre of the Province. At present, none of the dates are exported, except for some small scale road traffic, but Hofuf still keeps its local commercial position in Al-Hasa region, mainly for agricultural production and on a much larger scale than Qatif.

Recently, economic activities have increased with the growth of the Province, and this has brought Hofuf recognition as the third most important town, after Dammam and Al-Khobar in the function of the region's commercial centre.

Increasing demands for a wider variety of imported goods within the new development phase of the region, reflect the new growth of Hofuf's economy, particularly over the last few years (see Table 8.7 showing the increase in number of firms in 1967 and 1971).

TABLE 8.7

GROWTH IN NUMBER OF FIRMS IN HOFUF (1971)

Element	1967	1971	Rise	% increase
Establishments	2149	2249	100	4.7
Workers	3892	3764	128	3.3
Average Number of Workers per firm	1.8	1.7	1.3	

Source: Ministry of Finance, Central Department of Statistics

In 1971 the number of commercial and industrial firms in Hofuf accounted for about 21.8% of the total in the Eastern Province. In Hofuf the number of commercial firms was 79.6% while industrial establishments accounted for only 20.0%, the remainder being transport and storage businesses.[20] (See Table 8.8)

TABLE 8.8
SIZE AND TYPE OF BUSINESSES IN HOFUF IN 1971

Establishments	Number	%	Employees	%	Average number of workers per Establishment
Commercial	1790	79.6	2615	69.5	1:5
Industrial	451	20.0	1135	30.1	2.5
Transport and Storage	8	0.4	14	0.4	1.7
TOTALS	2249	100	3764	100	1.7

Source: Ministry of Transport, Central Department of Statistics

Almost all commercial establishments are small independent private companies owned by local inhabitants; 78.9% were small miscellaneous retailers of groceries, clothing, cloth, foodstuffs, drinks, furniture, carpets, building materials and motor spares, along with wholesale warehouses for foodstuffs, clothing, cloth, restaurants, hotels and coffee and drinks shops. Financial enterprises included banks and money changing shops. Services included agencies and businesses and social services. Headquarters establishments in Hofuf accounted for only 3.0% of the total, whilst branches of larger businesses centred in Dammam, Riyadh and Jedda were very few, and accounted for only about 6.7% of the total. (See Table 8.9)

Classification of commercial establishments by number of employees shows that about 81.1% have only one employee (which is similar to Qatif's 81.9%). The establishments employing between 2 and 4 employees accounted for 16.8%, those employing between 5 and 9 employees accounted for 1.6% and firms with 10-19 employees had a 0.3% share, the romainder had between 20 and 100 employees (See Table 8.10).

TABLE 8.9
DISTRIBUTION OF COMMERCIAL ESTABLISHMENTS IN HOFUF (1971)

Establishments	Number	%	Independent Establishments	Headquarters Establishments	Branch Establishments
Wholesale	35	2.0	17	7	11
Retail	1413	78.9	1298	40	75
Restaurants and Hotels	50	2.8	40	4	6
Commercial Firms	2	0.11	1	-	1
Financial Firms	6	0.33	3	-	3
Estate Agents	7	0.40	5	1	1
Construction	6	0.33	5	-	1
Services	271	15.33	248	2	21
TOTALS	1790	100	1617	54	119
Percentage	-	100	90.3	3.0	6.7

Source: Ministry of Finance, Central Department of Statistics

TABLE 8.10
CLASSIFICATION OF COMMERCIAL ESTABLISHMENTS
BY NUMBER OF EMPLOYEES (1971)

Establishments	1	2-4	5-9	10-19	20-49	50-99	100+	Totals
Wholesale	16	17	1	-	1	-	-	35
Retail	1237	166	7	3	-	-	-	1413
Restaurants and Hotels	26	18	6	-	-	-	-	50
Commercial Firms	1	1	-	-	-	-	-	2
Financial Firms	3	1	-	1	1	-	-	6
Estate Agents	2	3	-	1	1	-	-	7
Construction	5	-	-	-	-	1	-	6
Services	161	95	14	1	-	-	-	271
TOTALS	1451	301	28	6	3	1	-	1890
Percentage	81.1	16.8	1.6	0.3	0.2	0.05	-	100

Source: Ministry of Finance, Central Department of Statistics

In an examination of the type of employees working in the commercial establishments, it was found that these divided into two categories - wage earning and unpaid. In 1971 (See Table 8.11) about 71.0% of all workers in Hofuf were unpaid, and this percentage is much lower than the 82.6% figure for Qatif. Almost all these unpaid

workers were the proprietors or members of their family, and this situation applies to most businesses in the Eastern Province.

TABLE 8.11
TYPE OF EMPLOYEES IN COMMERCIAL ESTABLISHMENTS (1971)

Establishment	Unpaid	Paid	Total
Wholesale	34	61	95
Retail	1487	216	1703
Restaurants and Hotels	46	64	110
Commercial Firms	-	3	3
Financial Firms	3	55	58
Estate Agents	3	71	74
Construction	5	89	94
Services	259	199	478
TOTALS	1857	758	2615
Percentage	71.0	29.0	100

Source: Ministry of Finance, Central Department of Statistics

Industrial Activities

Hofuf has long been an urban and commercial centre for the Oasis of Al-Hasa, and also a centre for traditional industries such as the material for the Uobi and Mashalih (the famous traditional garments for men and women, hand-made in Al-Hasa region for many years). These industries have more recently been converted to modern machinery, and the traditional hand crafts are dwindling. Hofuf has also been famous for many years for hand-made copper kitchen utensils and coffee pans (Dilal), and other craft industries such as gold and silver work.

The new economic phase of industry in Hofuf has changed the old ways; small handcraft industries have been modernised and mechanised, and some new industries have been introduced in Hofuf, such as the date industry, ice plant, soft drinks factory, electricity and work-shops for carpentry, metal, motor car repairs and others. In 1971 there were 459 industrial firms in Hofuf (20.0% of the total). Textile and clothing firms were the largest group, with 27.0% of the

total; second was the food and ice industry with 18.7%; third metal work shops 17.2%; fourth the carpentry and furniture industry with 15.9% and the remainder were made up of small groups of miscellaneous firms (See Table 8.12).

TABLE 8.12
DISTRIBUTION OF INDUSTRIAL FIRMS AND TRANSPORT AND STORAGE IN HOFUF IN 1971

Establishments	Number	%	Independent Establishments	Headquarter Establishments	Branches Elsewhere
Agriculture	4	0.9	4	-	-
Food and Ice	86	18.7	74	2	10
Textile and Clothing	124	27.0	107	5	12
Carpentry & Furniture	73	15.9	64	3	6
Paper Products and Printing	4	0.9	4	-	-
Metal Workshops	79	17.2	72	1	6
Electricity	1	0.2	-	-	1
Water Distribution	3	0.7	3	-	-
Other Industries	77	16.8	72	1	4
Transport & Storage	8	1.7	2	1	5
TOTALS	459	100	402	13	44

Source: Ministry of Finance, Central Department of Statistics

Classification of industrial establishments by number of employees in 1971 showed that 52.1% employed only one worker, 39.9% employed between 2 and 4 workers, 6.3% employed between 5 and 10, and the remainder had between 10 and 100 employees (See Table 8.13).

In 1971 the employees working in Hofuf's industrial establishments fell into two categories, 57.8% were wage earning, and 42.2% were unpaid (See Table 8.14).

TABLE 8.13
CLASSIFICATION OF INDUSTRIAL ESTABLISHMENTS
AND TRANSPORT AND STORAGE BY NUMBER OF EMPLOYEES (1971)

Establishments	1	2-4	5-9	10-19	20-49	50-99	100+	Totals
Agriculture	-	4	-	-	-	-	-	4
Food and Ice	21	59	5	-	-	-	1	86
Textiles & Clothing	95	28	-	-	1	-	-	124
Carpentry and Furniture	36	34	2	1	-	-	-	73
Paper Products and Printing	3	-	1	-	-	-	-	4
Metal Workshops	37	37	5	-	-	-	-	79
Electricity	-	-	-	-	-	1	-	1
Water Distribution	-	-	3	-	-	-	-	3
Other Industries	43	17	13	4	-	-	-	77
Transport and Storage	4	4	-	-	-	-	-	8
TOTALS	239	183	29	5	1	1	1	459
Percentage	52.1	39.9	6.3	1.1	0.2	0.2	0.2	100

Source: Ministry of Finance, Central Department of Statistics

TABLE 8.14
TYPE OF EMPLOYEES IN INDUSTRIAL ESTABLISHMENTS
AND TRANSPORT AND STORAGE IN HOFUF (1971)

Establishment	Unpaid	Paid	Total
Agriculture	6	6	12
Food and Ice	89	250	339
Textiles and Clothing	127	65	192
Carpentry and Furniture	85	60	142
Paper Products & Printing	3	6	9
Metal Workshops	93	68	161
Electricity	-	61	61
Water Distribution	1	18	19
Other Industries	74	123	197
Transport and Storage	7	7	14
TOTALS	485	664	1149
Percentage	42.2	57.8	100

Source: Ministry of Finance, Central Department of Statistics

Distribution of Special Functions

As the principal urban and service centre of the Oasis, Hofuf has many special functions. It is the home of the government offices for the Oasis and the shopping centre where many villagers and townspeople shop for their everyday requirements and the Thursday market (Suq Al-Khamis) held outside the city attracts large crowds every week. These functions emphasise Hofuf's importance to the people of the Oasis and paved roads now link it with all the Oasis towns and even with Dammam, Dhahran, Al-Khobar, Riyadh and Qatar; it is also linked by railway with the towns of Dammam, Dhahran, Abqaiq and Riyadh. Further consideration of spheres of influence is deferred to the conclusion, where all the case-study settlements will be considered.

Hofuf City as the Administrative Centre for Al-Hasa Oasis

Hofuf is the sub-central administrative centre for the Oasis; the governor's residence is in the east of the old town of Al-Kut and the main courthouse of Hofuf is also situated in this Quarter. Hofuf is the urban centre of Al-Hasa in the site of the Royal Palace which is situated to the west of Al-Rigaigah Quarter, south-west of Hofuf. The palace is for the use of the Royal Family when they visit the Oasis, and is one of two in the Province (the other one is situated in Dammam).

Hofuf as a Shopping Centre (see Fig.8.22 photo 1973)

The main shopping centre in Hofuf occupies the long main street, and runs north to south in the centre of the city; starting in the north the streets are:- Al-Mubarraz, Al-Khamis and Al-Uam Streets. There are also Municipal (baladiya) Street, Al-Kut Street, Al-Rofa'aa Street and Al-Salihiya Street, and the lane which consists mainly of food stores (suq.) The central shopping area of Hofuf is Municipality Square. (see Fig.8.23)

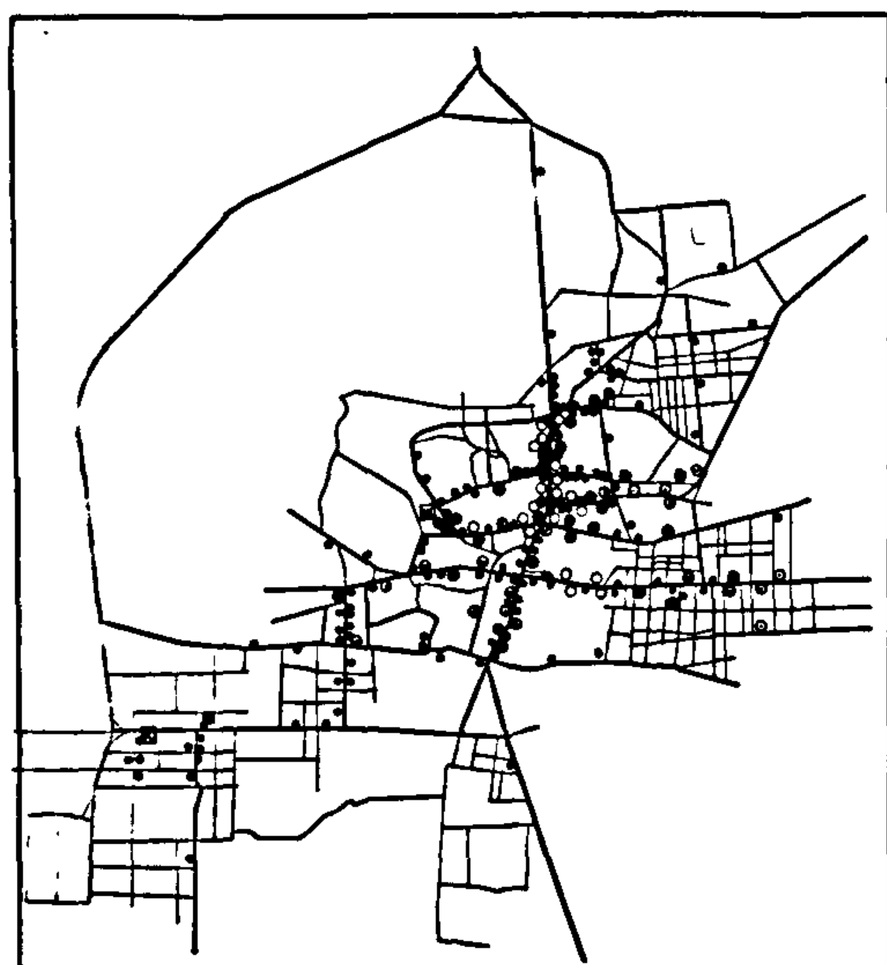
FIG.8.22. HOFUF SHOPPING CENTRE. (1973)

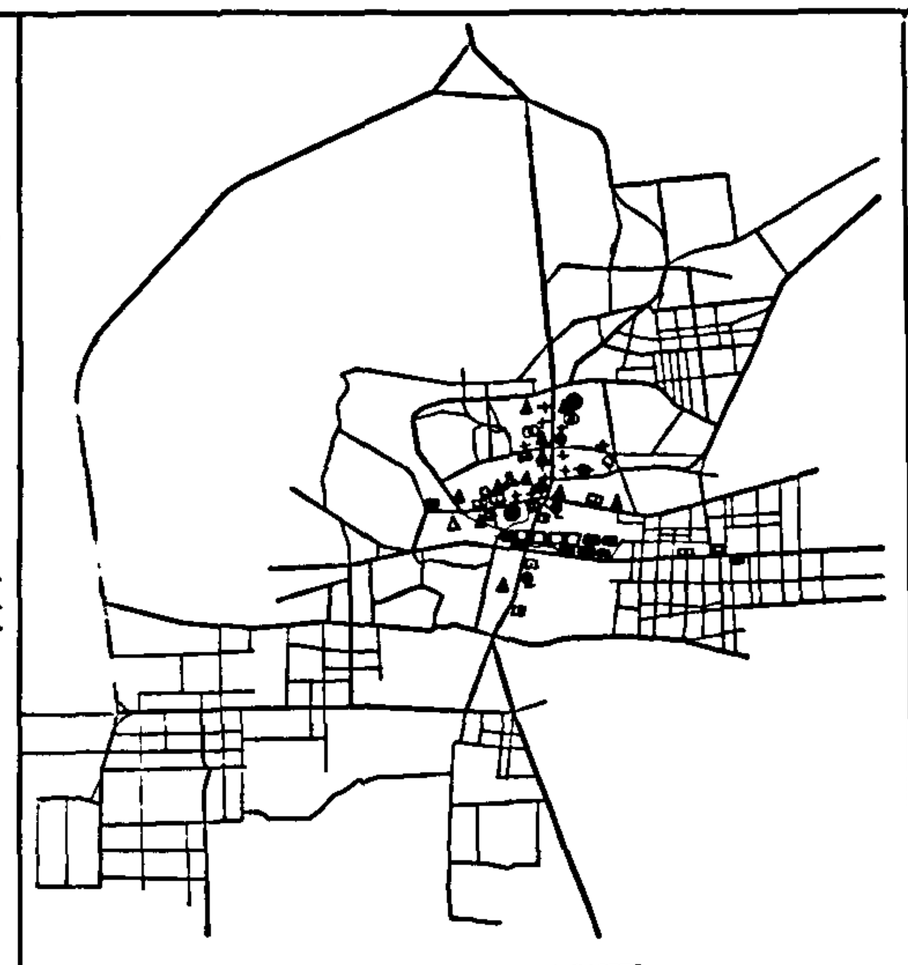
Baladiya Square.

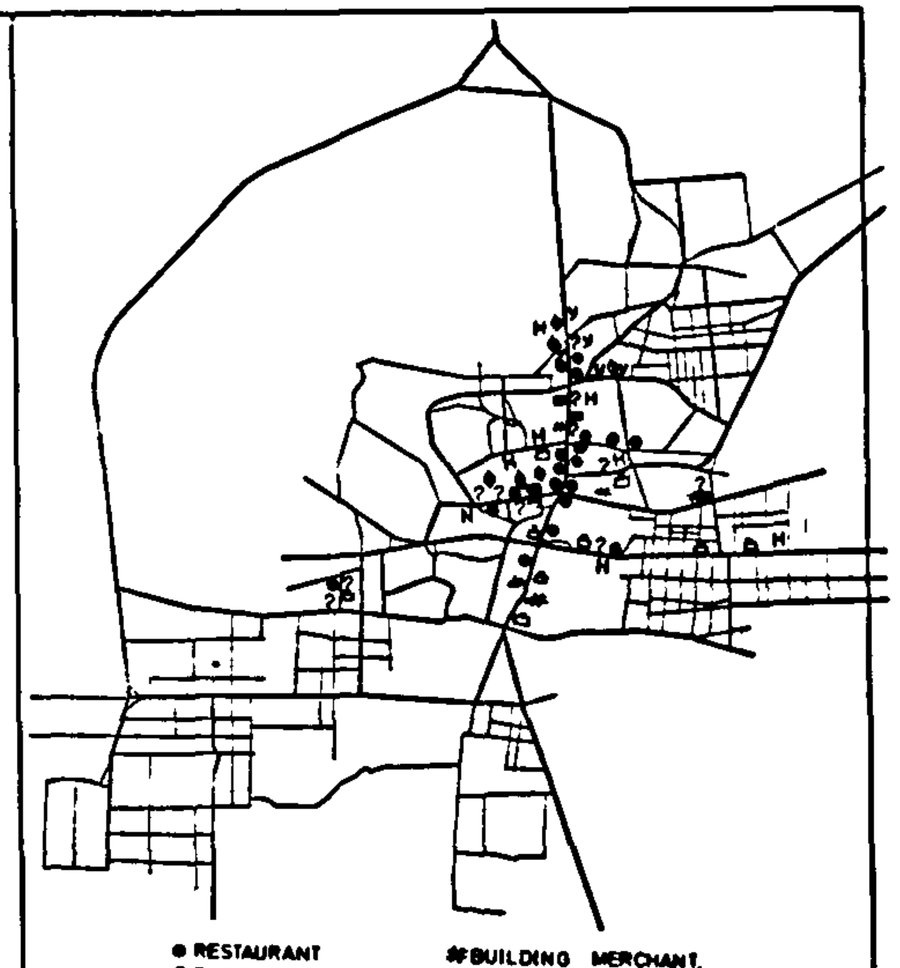
Baladiya Street.

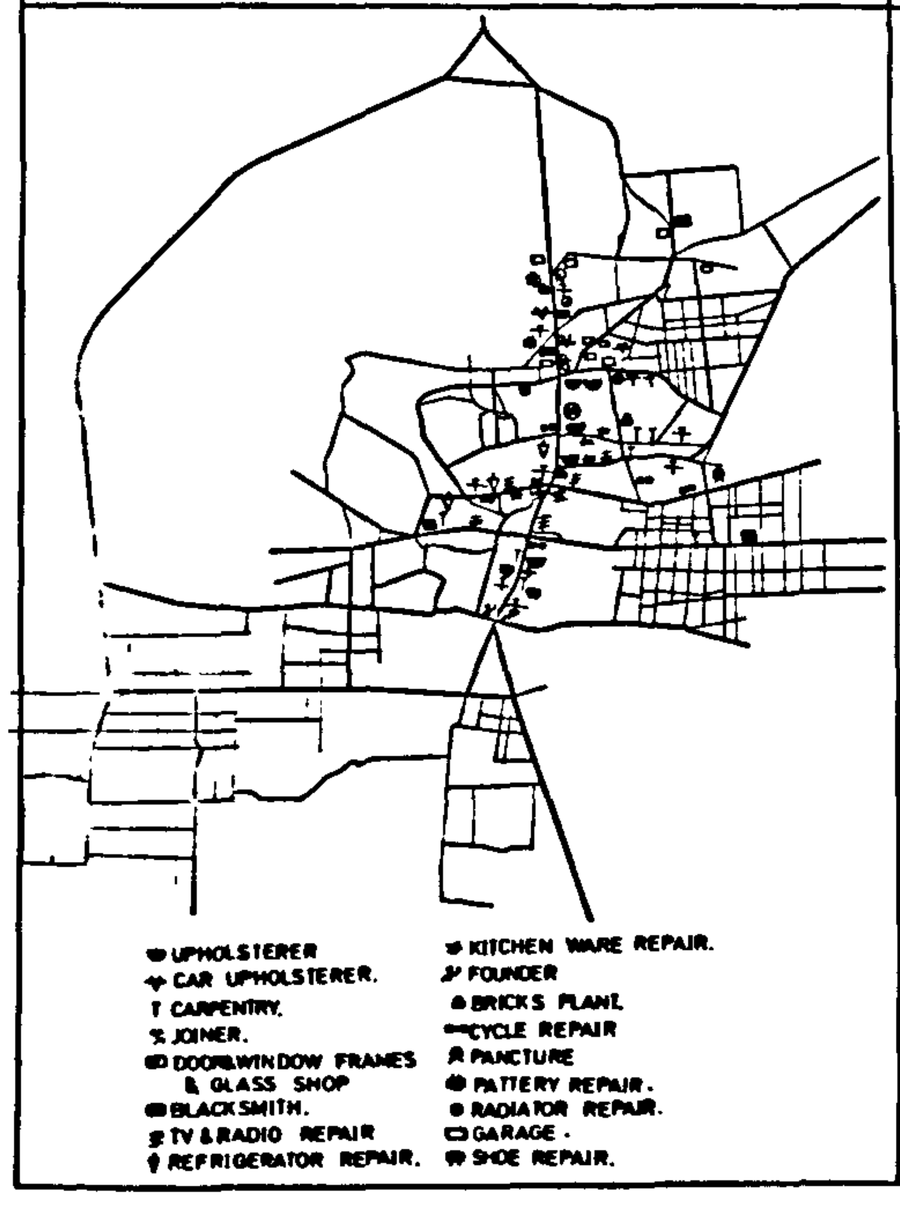
FIG.8.23. HOFUF SHOPPING CENTRE.

Wholesale food stores are almost all in Al-Khamis Street and Municipal Square, and retail food shops are in Al-Khamis Street outside the covered market (Al-Qaysaryia) or Suq Al-Hokuma (the government suq); and also in the lane which runs parallel to Al-Khamis Street from the west. In the aforementioned suq, a wide variety of foodstuffs, including greengroceries, poultry and eggs are offered by traders, who display their goods on the floor of the suq. The non-food items such as kitchen utensils, electrical goods, building materials and hardware etc, can be found at Municipality Street, Municipality Square and Al-Khamis Street. Cloth and clothes for men, women and children are mainly to be found at the old covered market of Al-Qaisaryia, which has about 380 shops; retailing the traditional clothing and cloth of the local people and the Bedouins. The new covered market at Municipality Street has about 85 shops and floor stores selling leather goods, watches, cosmetics and perfume, cloth and ladies' and children's modern style clothing. The 34 goldsmiths' shops are clustered in a street lane off Municipality Square. Government and business offices and banks are distributed between Al-Khamis, Municipality and Al-Uam Streets in the centre of the city. Motor spares, garages and motor repair shops are mainly found in the northern area of the city centre at Al-Mubarraz and Al-Rifa'aa Streets; workshops for household repairs, carpenters and joiners and TV and radio repair shops are mainly in the old Quarter of Al-Kut with a few in Al-Khamis Street, Municipality Square and Municipality Street, and Al-Uam Street. (See Table 8.5 and Fig.8.24).









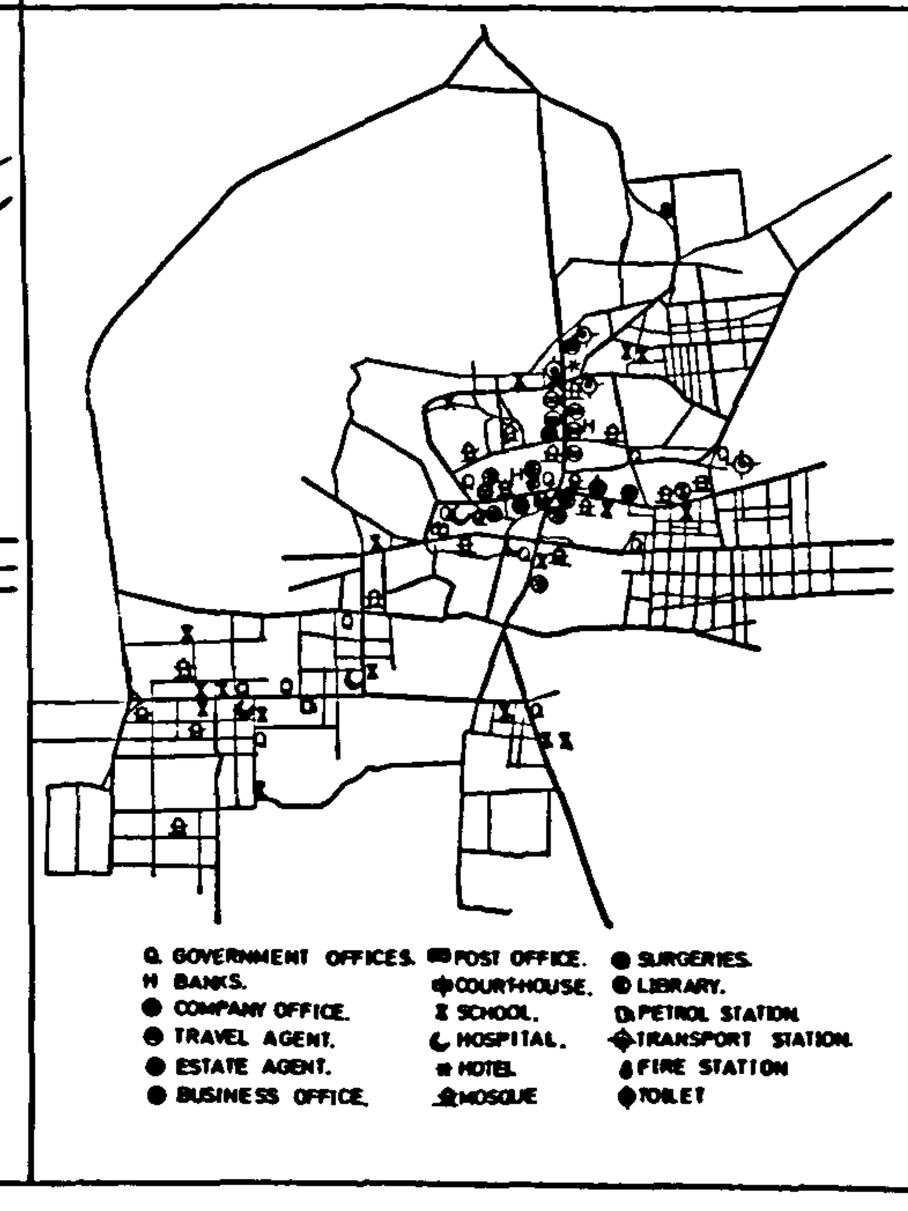


FIG 8.2.4 DISTRIBUTION OF SHOPS, WORKSHOPS, OFFICES, AND SOCIAL SERVICES IN HOFUF. (1973)

TABLE 8.15
BUSINESSES IN HOFUF SHOPPING CENTRE 1973

Group No.	Type of Shops	Municipal Square & Al-Khamis Street	Municipal Street	Al-Uam Street	Al-Kut Street	Muharraz Street	Street Lane	Al-Rofa'aa Street	Al-Salihyia Street	Total
1.	Wholesale Foodstuffs	18	3	-	5	-	-	-	6	32
2.	Retail Foodstuffs	10	6	1	3	-	16	-	-	36
3.	Groceries	7	7	5	4	-	-	7	8	38
	Greengroceries	2	-	2	-	-	5	-	-	9
	Bakers	4	3	1	8	-	1	4	9	30
	Dates	-	-	1	-	-	-	-	-	1
	Butchers	-	-	-	1	-	-	1	-	2
4.	Cloth	-	-	68	-	-	-	-	1	69
	Women's/Children's Clothing	-	-	45	-	-	-	-	-	45
	Men's Clothing	-	-	15	-	-	-	-	-	15
	Tailors	-	6	9	-	-	-	1	2	18
5.	Kitchen Ware	14.	4	-	1	-	1	-	1	21
	Electrical Goods	7.	12	-	-	-	-	-	-	19
	Sewing Machines	-	-	1	-	-	-	-	-	1
	Household Furniture	2	-	1	-	-	-	2	-	5
	Carpets	-	1	-	-	-	-	-	-	1
	Decorators	1	1	-	-	-	-	-	-	2
	Second-hand Household Goods	-	-	-	1	-	-	-	-	1
6.	Cosmetics and Perfume	1	-	-	-	-	-	-	-	1
	Goldsmiths	-	-	3	-	-	-	-	-	3
	Watch Repairs	-	-	-	3	-	-	-	-	3
7.	Chemists	2	5	-	-	-	-	-	-	7
	Booksellers	3	-	-	-	-	-	-	-	3
	Records	-	2	-	1	-	-	-	-	3
	Cycle Shops	1	-	-	-	-	-	-	-	1
8.	Restaurants	3	1	3	-	1	-	-	-	8
	*Fawwal Shops	1	-	-	-	-	-	-	-	1
	Coffee Shops	2	2	-	3	2	-	2	2	13
9.	Photographers	5	3	-	-	-	-	-	-	8
	Men's Hairdressers	3	6	4	5	1	-	1	3	23
	Launderers	2	3	3	-	1	-	1	2	12
10.	Building Merchants	2	-	2	-	-	-	2	-	6
	Hardware	-	11	-	-	2	-	1	1	15
	Gas Dealers	-	1	-	-	-	-	-	-	1
	Motor Spares	6	-	-	-	11	-	8	-	25
11.	Warehouses	-	-	-	1	1	-	2	2	6
12.	Miscellaneous Shops	12	22	36	51	4	18	7	54	204

TABLE 8.15 (continued)

Type of Workshops	Municipal Square & Al-Khamis Street	Municipal Street	Al-Uam Street	Al-Kut Street	Mubarraz Street	Street Lane	Al-Rofa'aa Street	Al-Salihyia Street	Total
*Upholsterers	9	-	4	4	-	1	-	-	18
Car Upholsterers	-	-	-	-	5	-	-	-	5
Carpentry	1	1	3	-	3	-	7	1	16
Joiners	-	-	2	17	-	-	1	1	21
Door & Window Frames & Glass Shops	-	-	-	-	1	-	-	1	2
Printing	-	-	-	-	1	-	-	-	1
Blacksmiths	21	-	-	-	1	-	7	-	29
TV & Radio Repairs	4	1	1	-	-	-	1	-	7
Refrigerator Repairs	1	5	-	-	-	-	-	-	6
Kitchen Ware Repairs	-	1	-	13	-	-	-	-	14
Founders	-	-	3	-	-	-	-	-	3
Brick Plant	-	-	-	1	1	-	-	-	2
Cycle Repairs	-	7	3	7	-	-	2	3	23
Pump Motor Repairs	1	-	2	-	-	-	-	-	3
Puncture Repairs	-	-	-	2	3	-	-	-	5
Battery Repairs	-	-	-	-	4	-	-	-	4
Radiator Repairs	-	-	-	-	1	-	1	-	2
Garages	-	-	-	-	13	-	7		20
Shoe Repairers	-	-	3	-	-	-	-	-	3
Type of Offices									
Government	-	1	1	-	1	-	-	3	6
Banks	1	1	-	-	-	-	-	-	2
Company Offices	3	-	-	-	-	-	-	-	3
Travel Agents	2	-	-	-	-	-	-	-	2
Estate Agents	-	1	-	-	-	-	-	-	1
Business Offices	4	9	-	1	-	-	1	1	16
Post Offices	-	2	-	-	-	-	-	-	2
Court Houses	-	2	-	-	-	-	-	-	2
Police Station	-	1	-	-	-	-	-	-	1
Type of Social Services									
Schools	-	3	1	-	-	-	-	-	4
Hospitals	-	1	-	1	-	-	-	-	2
Hotels	2	-	-	-	-	-	-	-	2
Mosques	2	1	2	1	-	-	-	-	6
Surgeries	7	6	1	-	-	-	-	-	14
Library	-	-	-	-	-	-	-	1	1
Petrol Stations	-	-	-	-	2	-	-	-	2
Transport Stations	4	-	-	-	-	-	-	-	4
Toilets	1	-	-	-	1	-	-	-	2
TOTALS	172	142	226	134	60	42	66	102	943

Source: Fieldwork

* Traditional Monajjid makers, and repairers of cotton couches, mattresses and pillows

Public Utilities

Water

Hofuf's position, away from the Gulf, has made the available water more suitable for drinking than that in Qatif. Hofuf's water supply of good drinkable quality comes from the wells and springs in the Oasis. In Hofuf there is a water network system connected to most buildings in residential and industrial consumer sections. The price of the water depends on the quantity consumed; those consumers using smaller amounts pay a lower price per unit than those using large amounts of water - including the industrial section; the service charges are the same for both sections.[22]

Sewage

The sewage system in Hofuf is at present under study, and will very soon be completed.[23] At present, individual septic tanks are used, which either percolate waste into the ground or are emptied periodically by specially equipped tankers.

Electricity

The electricity company of Hofuf (Al-Hasa Electricity Company) is the main power station supplying the whole of Al-Hasa Oasis, and is situated to the north of Hofuf. In 1973, the total number of units of electricity consumed in Hofuf was 11,445 units for domestic, commercial, industrial and public services.[24] There are different rates for domestic, industrial and public utilities; the cheapest rate is levied for industrial consumption, as industry uses the greater amount of power, the costs range from SR.0.06 - 0.10 per unit, and the charges to all other consumers is SR.0.14 per unit.

Social Facilities

Here and in each case-study are tabulated the main facts concerning the availability of social facilities such as schools, and hospitals, together with other service elements such as banks,hotels,etc. In the conclusion to this chapter a comparison is made in this respect between the five case-study settlements.

Schools - (see Table 8.16)

Hospitals and Medical Facilities

Hofuf has two hospitals, one government hospital with 190 beds and one private, with 215 beds.[25] Both are situated in Hofuf city centre, one in Al-Kut Quarter and the other at Municipal Street. There are also two out-patients' clinics located at Al-Salihiya and Al-Raigaigah Quarters, as well as two School Health Centres, one for girls and one for boys. There are 14 private doctors' surgeries, 7 in Al-Khamis Street and Municipal Square, 6 in Municipal Street and 1 in Al-Uam Street. In 1972 there were 9 retail chemists' shops, 7 in Al-Khamis Street, Municipal Square and Municipal Street.[26]

Hotels

There are three second and third class hotels in Hofuf, situated very close together at the northern end of the town, near Suq Al-Khamis.

Banks

The only bank serving the businesses in this area was a branch of the Saudi International Bank; there were also a few smaller money changing shops situated in the town centre.

Religion

In Hofuf about two-thirds of the population are Sunni and one-third Shiiah. The shiiah have their own mosques at Al-Kut and other parts of the old quarters. There are about 84 mosques, 22 of them Friday mosques.[27]

There are about six cemeteries in Hofuf, almost one for each Quarter; the largest in area is the cemetery at the north-west of Al-Kut.

Transport Stations

There are two taxi stations for Riyadh and Dammam situated to the north of Al-Khamis Street. The taxi station for local journeys within the Oasis is outside east of Hofuf and the stand point for taxis between the Quarters of Hofuf is not far, near Al-Qaisariah market and the shopping centre of the town.

TABLE 8.16

DISTRIBUTION OF SCHOOLS AND PUPILS AND THE CHANGES BETWEEN 1970 and 1972 IN HOFUF

LEVELS	SCHOOLS								PUPILS							
	1970			1972			Change		1970			1972			Change	
	B	G	T	B	G	T	No.	%	B	G	T	B	G	T	No.	%
Kindergarten	1	1*	2	1	-	1	1	50.0-	226	40	266	199	-	199	150	59.8-
Elementary	20	12	32	24	16	40	8	25.0+	8040	5483	13,523	8962	6615	15,577	2054	15.2+
Intermediate	3	1	4	5	3	8	4	50.0+	1097	378	1475	1623	866	2489	1014	68.7+
Secondary	1	-	1	1	1	2	1	50.0+	331	-	331	442	145	587	256	77.3+
Teacher Training 1. Intermediate	1	1	2	1	1	2	-	-	233	320	553	442	327	769	216	39.1+
2. Secondary	-	-	-	-	1	1	1	100.0+	-	-	-	-	51	51	51	100.0+
Blind School	1	-	1	1	-	1	-	-	197	-	197	166	-	166	31	15.7-
Industrial School	1	-	1	1	-	1	-	-	210	-	210	174	-	174	36	17.1-
Sewing School	-	-	-	-	1	1	1	100.0+	-	-	-	-	60	60	60	100.0+
Nursing School	-	1	1	-	1	1	-	-	-	12	12	-	20	20	8	66.7+
Evening Schools 1. Intermediate	1	-	1	1	-	1	-	-	196	-	196	212	-	212	16	8.2+
2. Secondary	1	-	1	1	-	1	-	-	76	-	76	130	-	130	54	71.1+
TOTALS	30	16	46	36	24	60	16	34.8	10,606	6233	16,839	12,350	8084	20,434	3955	22.4

Source: Ministry of Education and the Presidency for Girls' Education

* Private Kindergarten for both sexes

Parks and Recreational Areas

The only park in Hofuf is situated at the northern end of Al-Kut where there is an area of open space called Barahat Al-Khail (the Horse Square), and there is no other park anywhere else. The small date gardens or the smallest green areas take over the functions of parks and could be more important to some of the inhabitants.

Hofuf then is an ancient urban settlement which has been affected in many ways by the recent changes in the Eastern Province. As an Oasis town its long importance has given way to the oil settlements although the permament importance of water in this arid zone has resulted in a renewal of official interest in Al-Hasa. Thus, while Hofuf is no longer administratively or commercially the leading centre the population has grown and its economic and commercial functions have expanded, i.e. relative loss and absolute gain.

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B. QATIF

Qatif, in contrast to some of the other settlements examined, illustrates the impact of change on an old, and pre-oil established town. Qatif Oasis is located on a littoral territory with an area of 21 sq.km. (See Fig. 8.25). The Oasis contains great date gardens and 32 villages and 4 towns: Saihat, Anik, Safwa and the largest and most important town of the Oasis, Qatif City. The date gardens of Qatif Oasis are similar to those of Al-Hasa in the south of the Eastern Province; both oases are maintained by sub-surface water tapped by springs and wells. In Qatif Oasis there are approximately 15 springs and 150 wells and the cultivated area of the oasis is about 10,000 acres,[1] with approximately 1,000,000 date trees,[2] (see also chapter 3).

Irrigation problems in Qatif were aggravated many years ago by the digging of artesian wells in an attempt to keep a balance between agricultural demand and the irrigation system. The result of this digging was to create many swamps which caused a deterioration in the quality of the soil, yearly reduced the cultivated area, and resulted in a drop in production. The most important problem created by these swamps was the incidence of malaria, particularly at the end of the summer and beginning of autumn; and in the 1950's malaria attacked nearly 90% of the population,[3] and later spread to the urban areas of Qatif.

In 1955, Aramco Oil Company made a comprehensive study of the drainage system in Qatif, and plans were drawn up for a completely new drainage system, and this project was executed by the government in 1960-64. The project proved of immense value to Qatif Oasis, in overcoming many problems such as the excessive accumulation of salt in the soil, the large areas of swamp land, and the incidence of malaria among the population.

Qatif has for many years been connected with the town of Darin

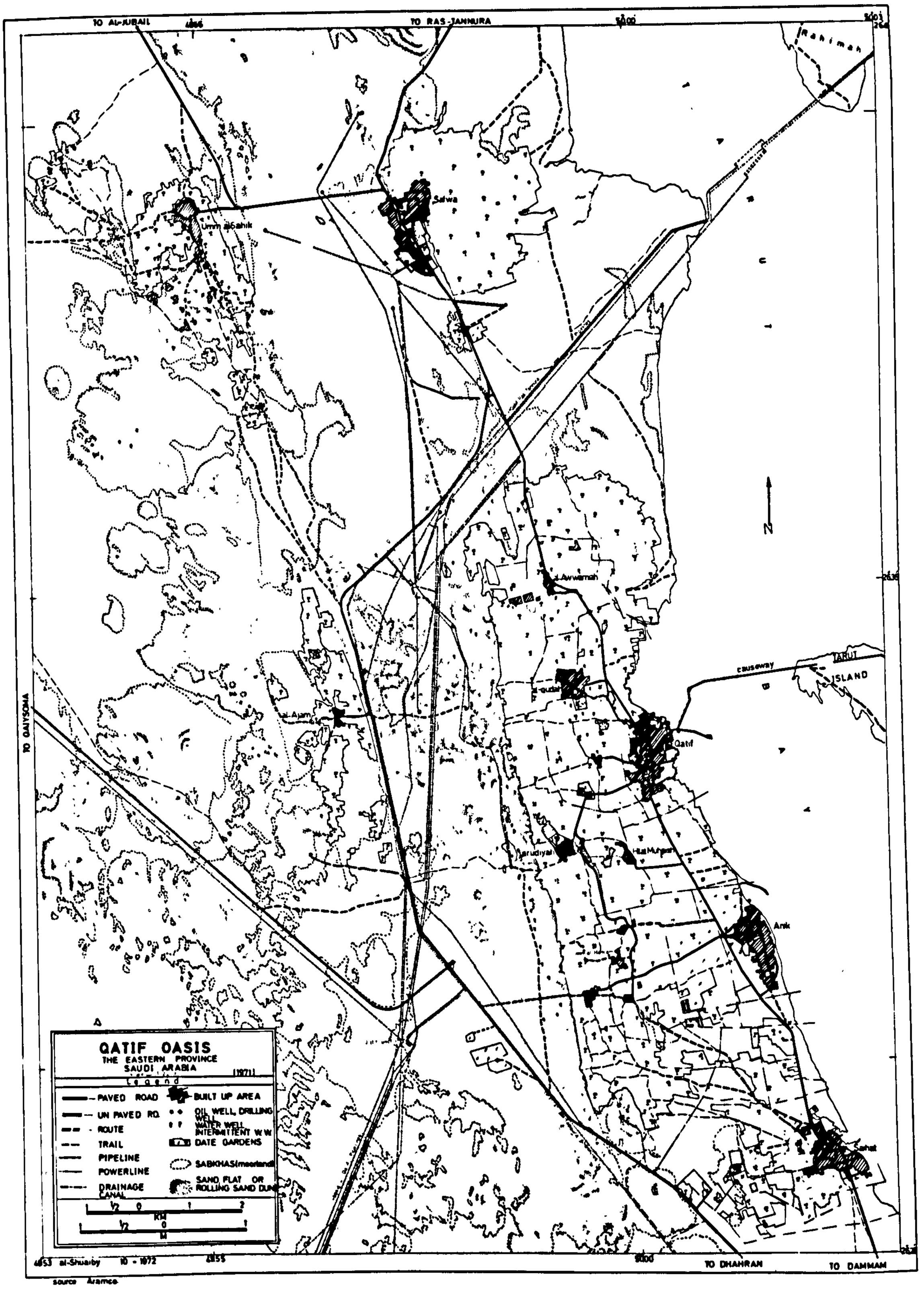


FIG.8.25. QATIF OASIS.

on Tarut Island, and in its earlier history must have been much larger than at the present time, as it was well-known as a trade and commercial centre. There is past evidence of trade with India and the Far East, particularly for pearls, when pearls were sent to India and Bombay, and evidence of this trading link is given in the frequent mention by medieval geographers and historians of the considerable pearling activities carried on by people living on the coast near Qatif,[4] and of Qatif's strategic position as the junction where overland routes from Mecca and Shaba joined sea routes from India and China, to the cities along the Mesopotamian rivers.[5]

Old coins found in Qatif area indicate its long standing both as a commercial centre and a cosmopolitan port. Arabic coins used in Al-Hasa called 'Tawila' (a long 'V'-shaped coin, approximate date AD 920)[6] are found along with coins from ancient Eastern Empires and Greek, Roman, Byzantine, Turkish, Persian, Indian, African and Chinese coins. Some of the Chinese coins discovered belong to the reigns of Shao-Shen (AD 1094-1098) and Shao-Ting (AD 1228-1233).[7]

1. Location and Site

Qatif City is situated on the vast flat coastal sands on the inner-most curve of a small bay. Its elevation is from 3-5 metres, A.S.L., and the highest point is about 8.8 metres in the north; the site generally slopes down to the sea, particularly from south-west to east. An off-shore coastal reef extends more than 10 Km. off shore and Qatif is linked by causeway with Tarut Island, about 5 Km. off shore.[8]

2. Historical Outline

Qatif is an ancient Arabian Gulf city, famous for its agriculture and its significance as the oasis trade centre. The discovery of ancient Arab coins and pottery in Qatif area prove the existence of ancient settlements, particularly the ruins of old houses adjacent to and west of the present-day Qatif. There is evidence of a large town, or even a city, partly overrun by sand dunes,[9] and the old city is almost cut in half by one large sand dune. Gravestones found in the area are inscribed

in the Sabean or Himyaritic alphabet, commemorating an early Christian era.[10]

Some archaeologists suggest that this could be the ruins of the ancient city of Gherva (or Gera), famous in the 'golden' era of trade. Unfortunately, no certain dates are known, and there are no records of the builders of this ancient city, but Arab historians and geographers such as Ibn-Khaldoun and Yaqut Al-Hamawat recorded that before Islam, Qatif belonged to the tribes of Bakir Bin Wael and Tamim; and later, at some unknown date, the tribe of Abdu Al-Kais came from Tihamah on the Red Sea and settled in the Qatif area. In AD 81, a story is told of a man named 'Yahya Bin Mahdi', who came to the Qatif people, pretending to be the messenger of Al-Mahdi (ancient prophets predicted he would convert the world, but he is yet to come). Yahya was an imposter, who extracted large sums of money from the people of Qatif.[11] This story dates back to the time of the Carmathians Religion in the Eastern Province, when Hofuf City was built on its present site. In AD 929, the Carmathians leader Abu-Tahir and his people, stormed the holy city of Mecca and stole the holy black stone of Ka'abah, which they took to Qatif in an attempt to establish Qatif as the holy city instead of Mecca.[12]

Yaqut Al-Hamaway stated that before Islam, Qatif was a village of Juzaimah Abdu Al-Kais.[13] During my fieldwork (23 November 1973), I interviewed a former Mayor of Qatif City, Mr. Mohammaed Al-Farisi, who has made a study of the history of Qatif, and he gave me the following information:

"The present city of Qatif was built in the 8th century (216 HD), when the people of ancient Qatif, 3 Km. west of the present Qatif, migrated to the littoral territory away from the sand dunes which had burried most of their city. They built their new city on the coast called Al-Qal'ah, the present quarter of Al-Qal'ah. The site of Qatif was known as 'Fisherman's Valley'. Al-Qal'ah later became the administrative and commercial centre of Qatif Oasis, and was surrounded by fortress walls early in the 18th century (1093 HD), by the Turkish ruler Ali Basha, as is written on the stone at the northern gate of Al-Qal'ah."

As has been mentioned earlier, Qatif Oasis was captured in the 16th century by the Portuguese, who constructed the famous Qatif Fort.[14] At the end of the 18th century, Qatif was governed by Al-Saud the First (between 1818 and 1871).[15] In 1871 Qatif again fell under Turkish rule, and was governed by a small Turkish garrison up to 1914, when Bin-Saud, the late King Abdulaziz, took over Qatif and Al-Hasa Oases.

3. The Population and its Growth

The population of Qatif originates from the ancient tribes of Rabi'ah, Medhar and Saba'a,[16] but the vast majority belong to the class known as Baharina , Shi'iah.* The Baharinah are mainly centred in the Eastern Province in Qatif City and Tarut Island, but they are also scattered in Bahrain, Qatar and other countries. During my fieldwork of 1973, I estimated that the population of Qatif was about 95% Shi'iah, the remaining 5% being Sunnis.

As in most other cities in the Eastern Province, no census has been taken in Qatif, but some estimates have been prepared concerning population size (See Table 8.17). I have prepared my own estimates for Qatif City's population from aerial photographs for 1934, 1950, 1960 and 1970 and Table 8.18 gives population estimates and percentage increases in Qatif for these years.

TABLE 8.17
ESTIMATED POPULATION OF QATIF FOR SELECTED YEARS

Population		Year	Reference
Al-Qatif Oasis:	20,000-30,000	1950	Aramco (1952), 'The Arabia of Iben Saud', p.95
	30,000	1958	Aramco (1958), Minutes, ADD-ACE Meeting, p.1.
Qatif City	11,000	1958	Aramco (1958), Minutes, ADD-ACE Meeting, p.1.
	12,690	1963	Saudi Arabia (1962-63) Survey
	14,000	1968	Aramco (1962-68) Measuring the Changing Patterns of Aramco Saudi Employees

*Shi'iah is one of the two major Islamic sects, the other being Sunni.

TABLE 8.18
POPULATION ESTIMATED FROM AERIAL PHOTOGRAPHS OF QATIF

Year	Population	Percentage Increase
1934	6,000	-
1950	8,000	33.3
1960	11,000	37.5
1970	15,000	36.4

Source: aerial photograph analysis (personal estimation)

The greatest rate of population increase was observed between 1950 and 1970 due to the large scale developments and improvements over this period, which had a corresponding effect on population growth. In this period the new irrigation and drainage system was completed in the Oasis (1964), and many urban areas were linked with Qatif by paved roads, and these improvements have resulted in increased population in Qatif City and the whole oasis. There has also been a sharp rise in the number of oil employees and their families and the construction in 1962 of improved roads, and a cause-way linking Tarut Island with Qatif City (5 Km off shore)[17] has brought about a 6% increase in the number of motor vehicles. Home ownership programmes, along with improved facilities in Qatif as well as Al-Hasa, have encouraged the employees of the oil companies to settle there with their families, and the result is an expansion in the residents of these oases. (See Table 8.19 showing the increase in the number of oil employees living with their families in 1968, compared with 1962. Sample Survey carried out by Aramco, 1968).

5. The Morphology of Qatif City

The city is oblong in shape, and runs parallel to the coast line. The length from north to south is about 1,800 metres and the width from east to west is about 1,120 metres. The built-up area extends from the coast at Al-Qal'ah on the north-east periphery southwards away from the sea, leaving a zone of date gardens between

the town and the sea on the eastern side. This zone is about 775 metres wide at the southern end of the town, isolating the residential areas from the sea. The town of Qatif is almost surrounded by date gardens, except on the north-east.[18]

TABLE 8.19
ARAMCO SAUDI EMPLOYEES: LOCATION OF HOUSEHOLD RESIDENCE 1962 & 1968

Location of Residence	1962		1968		Distance from nearest Aramco facility (Km)
	Estimated No. of Employees	%	Estimated No. of Employees	%	
Qatif Oasis	3473	32.4	2790	28.9	31
Al-Hasa Oasis	2710.	25.3	2332	24.2	84
Company Town Sites	1736	16.2	2429	21.8	1
Dammam	974	9.1	896	11.4	18
Khubar	1101	10.3	691	8.8	12
Tarut	466	4.3	340	3.5	39
Other	254	2.4	137	1.4	-
TOTALS	10,714	100	9,615	100	

Source: After Aramco Sample Survey, Table V

In 1905 Lorimer described Qatif as 'the walled town' known as Al-Qalah, with seven smaller village suburbs - Bab Al-Shamal, Jurari, Madaris, Maiyas, Dobaibiyah, Kawaikib and Shariah. Qatif has since expanded to include the suburbs, which have now become Quarters of Qatif town. Further new quarters have been established since the discovery of oil, including Al-Bustan, Al-Mashhad and Al-Bahari, situated in the west and north-west of Al-Qatif.

The Quarters of the City

1. Al-Qal'ah - the oldest quarter situated in the north-east of Qatif, was surrounded by a wall, and had eleven forts linked by bridges. This wall, which was ten metres high and two metres thick had a total length of 364 metres, with four gates;[19] two on the coast to the north-east and south-east, the third to the north-west opening to Bab Al-Shamal, and the fourth in the south-west of Qal'ah.

Al-Qal'ah housed the main administrative offices, ie. the office of the Governor of Qatif, the Emirate, the Custom Stations and the Post Office. The main shopping centre (suq) was the Suq Al-Khamis in the west of Al-Qal'ah. Al-Qal'ah may then be regarded as the nucleus of the town as a whole and the surrounding area, in which until recently it was the centre of accretion of all urban and service functions, the central core of ancient and traditional residential building remaining unchanged to the present day.

2. Bab Al-Shamal - in the north of Qatif and west of Al-Qal'ah Quarter; the main street of Suq Al-Khamis separates these two Quarters. Bab Al-Shamal was a suburb which traditionally was occupied by pearl divers, fishermen, mat makers, basket makers and cage makers, and some date farmers. At present, Bab Al-Shamal is the site of Qatif Municipality Offices, and a local residential area. It also has two smaller quarters, the Fariq of Al-Bustan and Jurari.

3. Al-Bahari - this Quarter lies north-west of Qatif, and west of Fariq Al-Bustan. Half of this Quarter is occupied by date gardens. Al-Bahari was a walled village settled by the Baharinah people who were formerly employed in farming, making gypsum mortar and pearl fishing.[20]

4. Al-Tubi - to the south of Al-Bahari, and west of Bab Al-Shamal, and Al-Madaris, this Quarter is, like Al-Bahari, partly cultivated with dates. Once a walled village, it has been settled by Baharinah people working in cultivation.[21]

5. Al-Madaris - situated in the middle of Al Qatif, south of Bab Al-Shamal Quarter and south-west of Al-Qal'ah, this was a farming and trading village, and was walled only on the western side.

6. Al-Shari'ah - to the east of Qatif, south of Al-Qal'ah, and situated in the middle of Qatif- the main street of the town divides the two quarters of Al-Shariah and Al-Madaris. Formerly an unwalled

village, the people were partly Baharinah, working as shopkeepers, rice huskers, coppersmiths, blacksmiths and donkey owners.

7. Maiyas - to the south of Al-Madaris and Al-Tubi Quarters, south-west of Al-Shariah Quarter and west of the main street, Maiyas contains Fariq Umm Al-Saadah in the west side. It was a walled village occupied by the Baharinah people working in the cultivation of dates and as shopkeepers, bakers and butchers.[22]

8. Al-Kuwaki'b - south of Maiyas and Shariah Quarters, and south-east of Qatif, it is surrounded by date gardens from the east and south-east, and is divided into two parts (east and west) by the main street. Al-Kuwaiki'b was a walled village, settled by the Baharinah, working in the date gardens and as pearl divers.

9. Al-Dubaibiyah - south-west of Qatif and south-east of Al-Kumaiki'b, Al-Dubaibiyah was a walled village, settled by the Baharinah, working as farmers, shopkeepers and merchants.[23]

10. Al-Shuwakah - at the southern end of Qatif, this Quarter had two smaller quarters, Fariq Al-Hakah in the east and Fariq Al-Dirah in the south-west. Formerly a walled Baharinah village most of its occupants were engaged in farming and the weaving of tents.[24]

Each Quarter performed different functions for Qatif and for the harbour on the Gulf. Qatif was frequently invaded, and as a precaution its inhabitants built thick, high walls for defence. By the middle of the 20th century, most of the towns and villages had demolished these defences, and the settlements have been expanded. The villages extended towards old Qatif, "Al-Qal'ah" and the old town overflowed its former walled area. The expansion of the residential areas in both towns and villages has consolidated the town, and the former villages have now become Quarters of the present city.

The old quarter of Al-Qal'ah has remained intact, with mud houses squashed close together in narrow streets. After the removal

of the old walls which isolated the date gardens, the suburbs of Qatif have expanded, and the present picture is quite different now that these suburbs have joined up. Greatest development has taken place in the western and northern parts, and new modern houses are concentrated in the west facing the date gardens. This could be due to the relatively better conditions of humidity in the west as opposed to the east which faces the sea.

Urban Zone

1. The Core - the main street of Qatif is the centre of the city and runs from north to south, in what is known as Suq Al-Khamis and its surrounding area. In the city centre are all types of retail shops, banks, municipality, post office and other offices. Suq Al-Khamis market is and has been held here every Thursday since Qatif is a market centre for the Eastern Province. Many changes have taken place in Qatif, and its streets have been widened and modernised. Al-Qal'ah Quarter, which formerly had no shopping facilities, now has a few small local shops catering for the daily needs of its residents.

Unlike Hofuf, the former capital of the province, commercial activities in the centre of Qatif have not changed much, and most of the traders are local, with the exception of some employees in some commercial and industrial establishments.

2. The Integuments - the walls surrounding areas such as Al-Qal'ah have now been removed, making way for urban development. Twin processes of outward extension and internal re-organisation have taken place; new areas have been constructed, old streets widened and old houses modernised.

However, when compared with Dammam and Al-Khobar, development in Qatif and Hofuf has been slow; there are no real industries in Qatif, only the traditional trades of weaving, goldsmiths, blacksmiths and small craft workshops which are concentrated in Al-Madaris and Al-Maiyas Quarters. (See Fig. 8.38).

Development of Qatif's Urban Structure

The real development of Qatif as the urban centre of Qatif Oasis began after 1960, following the discovery of oil in the region. Safwa, the second urban centre in the Oasis was first developed and expanded before Qatif, mainly due to the home ownership programme introduced by Aramco. Greater numbers of the employees of the oil company made their homes in Safwa, which in 1905 was only a tiny walled village of a mere 350 houses.[25] It has now expanded west and south parallel to the major road to Ras Tannura, and a further extension to the south has been begun by employees of the oil companies.

Qatif's development began with the construction of the coastal road to Ras Tannura; swamps in the oasis made traffic movement difficult in some areas, and it was decided to concentrate on the development of Qatif. Early development and expansion was slow, but later improved, and by 1970 the town area was 57.5% greater than in 1960. (Fig.8.26, 8.27, 8.28 and 8.29, photographs of 1934, 1950, 1960 and 1970). (See Table 8.20 showing growth in Qatif 1934-1970).

TABLE 8.20

GROWTH SEQUENCE IN QATIF CITY 1934-1970 (acres)

Year	Acres	% Increase
1934	95	-
1950	126	32.6
1960	179	42.1
1970	282	57.5

Source: Aerial photographs

Since that day Qatif has

(a) Expanded internally in the open areas, to join the old towns of Al-Qal'ah and the suburbs; and

(b) narrow main streets have been widened and street lights have been installed.

FIG.8.26. QATIF IN 1934.

FIG.8 27. QATIF IN 1950.

FIG.828. QATIF IN 1960.

FIG.8.29 . QATIF IN 1970.

The exit streets link the surrounding villages of Qatif Oasis and join the inter-urban coastal road from Dammam south which runs through Qatif town to Ras Tannura in the north. The town of Qatif has grown rapidly to become an important administrative and sub-commercial centre, and its importance in the urban growth of the Eastern Province cannot be overlooked.

Planned and Unplanned Areas

1. Planned Residential Areas

The government anticipated the need for controlling the urban development in the plans for the new Qatif town. Its first step in 1958, was to plan internal expansion between the old town and its nearby suburbs. The second step was for further expansion outside the town in areas such as Al-Bustan and Al-Sub to the north; Al-Jurari to the west; Al-Dubaibiyah to the south-west; Al-Massuadiah to the south; Al-Ammariah or Fariq Al-Hakah and Al-Kuwaikib to the south-east and Al-Shariah to the east of Qatif. Recently urban expansion has been considerably curtailed in areas adjacent to the date gardens and cultivated areas.

2. Unplanned Residential Areas

Where earlier settlements existed, in the oldest parts (e.g. Al-Qal'ah, and its surrounding Quarters, formerly villages), these were used as the kernel of the town. Such developments were unplanned and their layout was determined by the size, shape and purchasability of agricultural land holdings (although in the absence of cadastral maps we know this only from personal report) and their development was totally uncontrolled. Former migrants to Qatif or its suburbs chose a site suitable to their own needs, adjacent to old-established residences. As a result, the old town developed in a maze of narrow, zig-zag streets, with tightly compacted houses, The initial expansion of the unplanned areas was, as has already been mentioned, totally uncontrolled, and after the removal of the wall in 1949, the suburbs of Bab Al-Shamal, Al-Madaris, Al-Shariah, Al-Maiyas and Al-Kuwaikib were joined to the town.

The New Plan

The new plan is divided into two sections:

1. The plan for future expansion.

2. The plan to change the whole area of Qatif town to re-shape the face and functions of the city. The most important feature of this plan is to open new streets and widen existing streets in older parts of the town, improving street systems. The straight main street which divides Al-Qatif north to south is approximately 15-20 metres wide in the north; it widens towards the middle to 25 metres, and gradually becomes narrower to the south, being only about 10 metres wide in the southern end of Qatif.

The secondary streets planned to link with the main street at roundabouts in the middle of Qatif vary in width, between 10, 13 and 18 metres. The new residential areas, both inside and outside the city, were included in the grid plan in small areas to the north and south of the city. Land was sub-divided into square blocks of 35 sq. metres, and developed by local residents or employees of Aramco, aided by the Aramco home development programme.

Planned Areas of Residential Expansion

The situation in Qatif differs from new towns in the Eastern Province as it was surrounded by many villages which, in the later expansion, became Quarters of the present city. Also it was surrounded by date gardens which further complicated plans for expansion.

Area A of the old town remained the same; new development taking place to the north of this area and north-east of Qatif, extending out to Tarut Bay in medium density groups of houses. Development is also taking place in Area C to the north of Bab Al-Shamal, close to the expansion of Area A, and the new Quarter of Al-Bustan. The new part of Area C has groups of high density houses, whereas the older

parts of the area have been left as before. The western side of Areas C, D and F are planned as residential areas in the new expansion of the town, and houses are grouped in high and medium density blocks. Two small areas to the north and the east of Area G are destined for expansion along with a further two developments in Area B, one among the date gardens close to the sea. (See Fig.8.30).

Most residential areas of the town are in high and medium density blocks, particularly areas A and C, in the north, and open spaces are found in the east of Area A. In the south of the town there are many open spaces; three in Area D, one in Area B and a very large one in between Areas F and G. Future expansion in Qatif appears to be in a westerly direction, through the larger date gardens, and to the north-east along the shore of Tarut Bay.

Sequence of Growth (Fig. 8.31)

It is obvious that the town of Qatif has 'grown up' during the period from 1934 to 1950; the map of 1934 (Fig.8.32) of the old town of Qatif shows Area A to be surrounded by a thick wall and only two small groups of houses; at Area C the suburb of Bab Al-Shamal joined the old town from the west, separated by Suq Al-Khamis. Areas B, D and E, the suburbs of Al-Shari'ah, Maiyas and Al-Kumakib joined, forming a triangular pattern. These three areas are separated from the old town by the cemetery and date gardens, but a small part of Area F, the suburbs of Al-Dubaibiyah, joins the other suburbs at the apex of the triangle. Area G is situated at the southern end, quite separate from the other areas, and these older parts saw little change between 1934 and 1950 (Fig.8.33). But, from 1950 to 1960 the map of 1960 (Fig.8.34) showed a tendency to coalesce, and the shape of the town was much enlarged. In this map, Areas B, C, D, E, F and G have joined together to form a complete outline of the town, but other areas are not yet linked by asphalt roads. An important factor on the expansion map of 1960 was the causeway linking Qatif with Tarut Island.

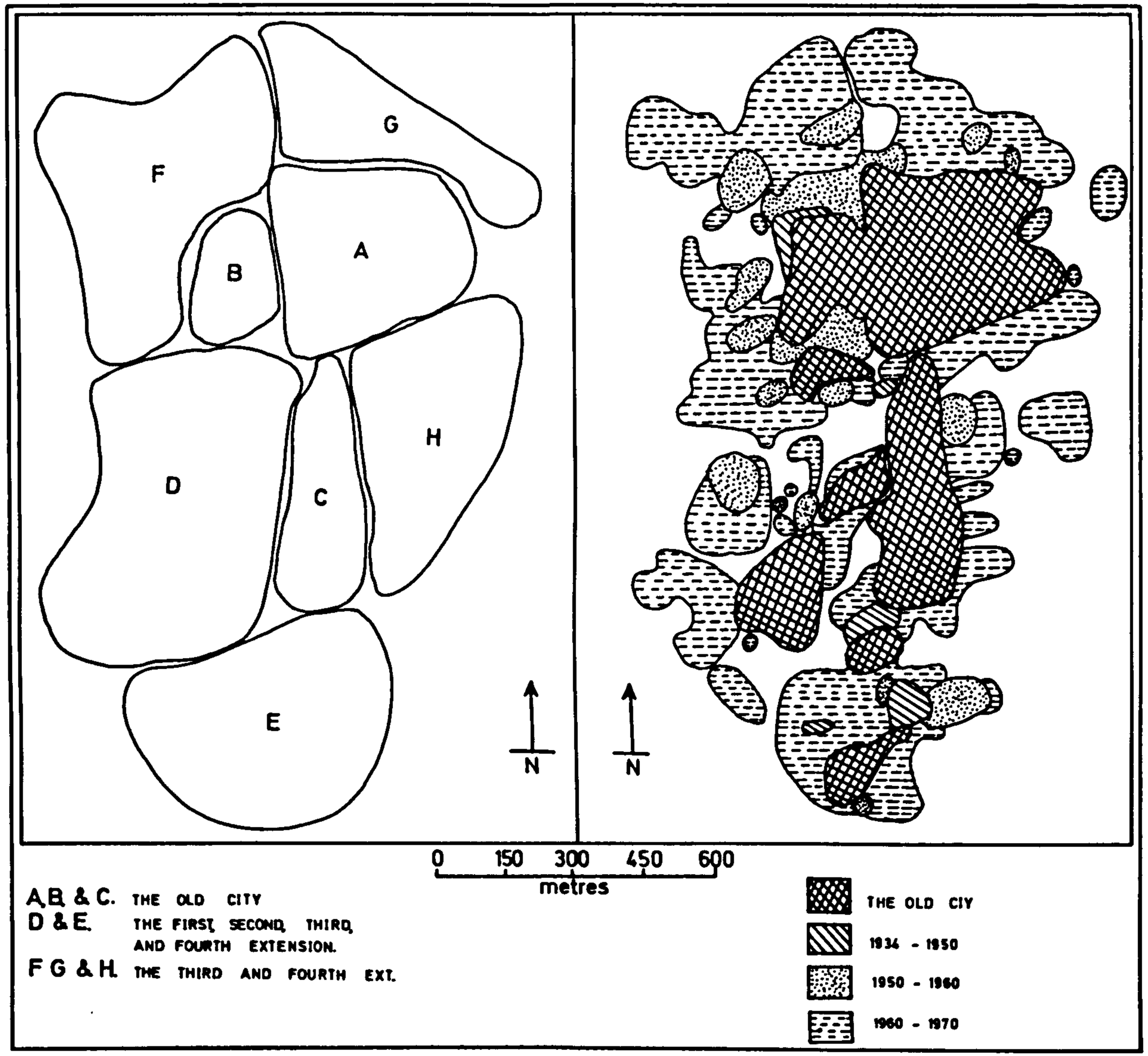


FIG. 8.30 THE RESIDENTIAL EXPANSION IN QATIF 1934 - 1970.

FIG. 8.31 THE SEQUENCE OF THE GROWTH IN QATIF 1934 - 1970.

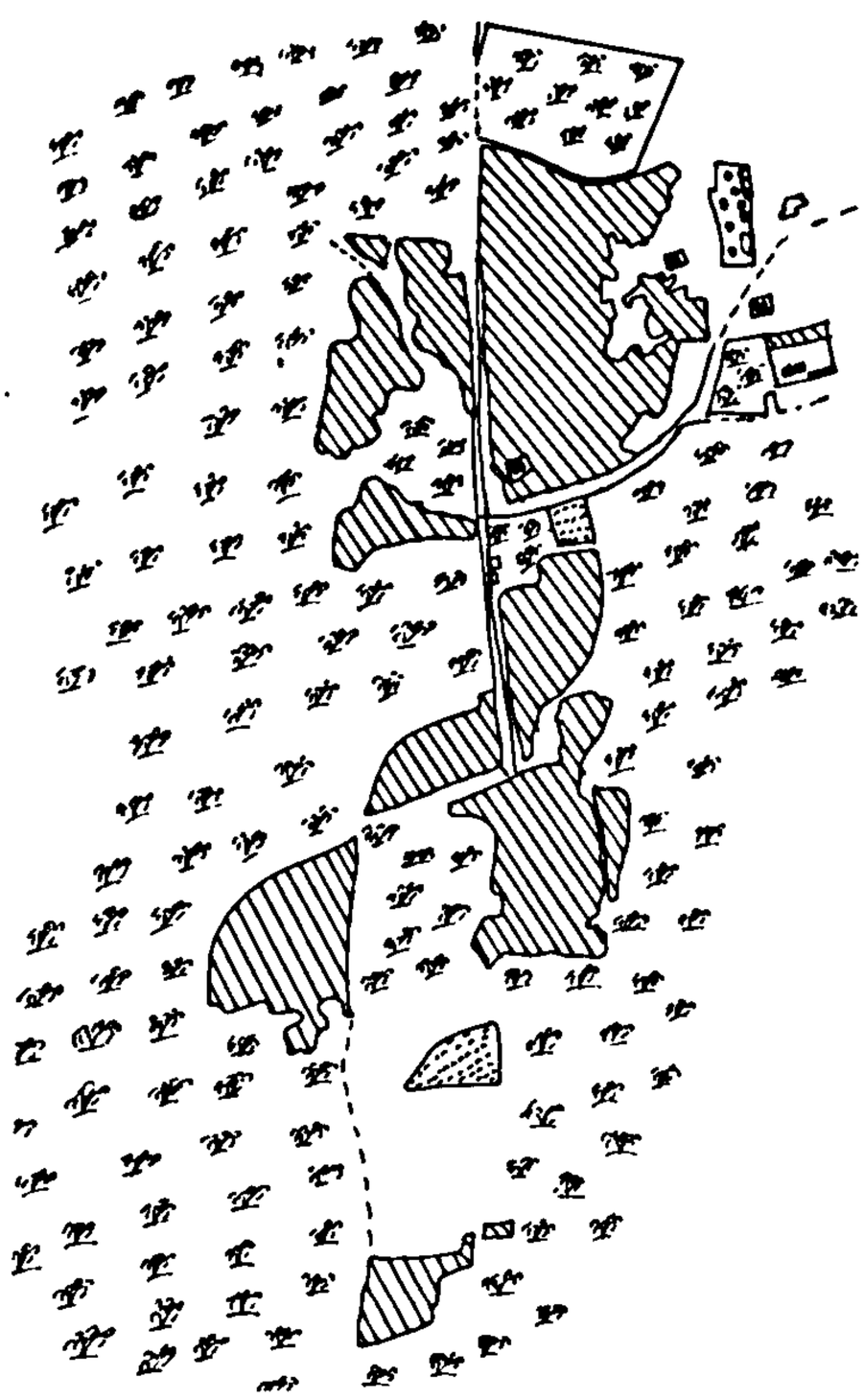


FIG. 8.32 - 1934

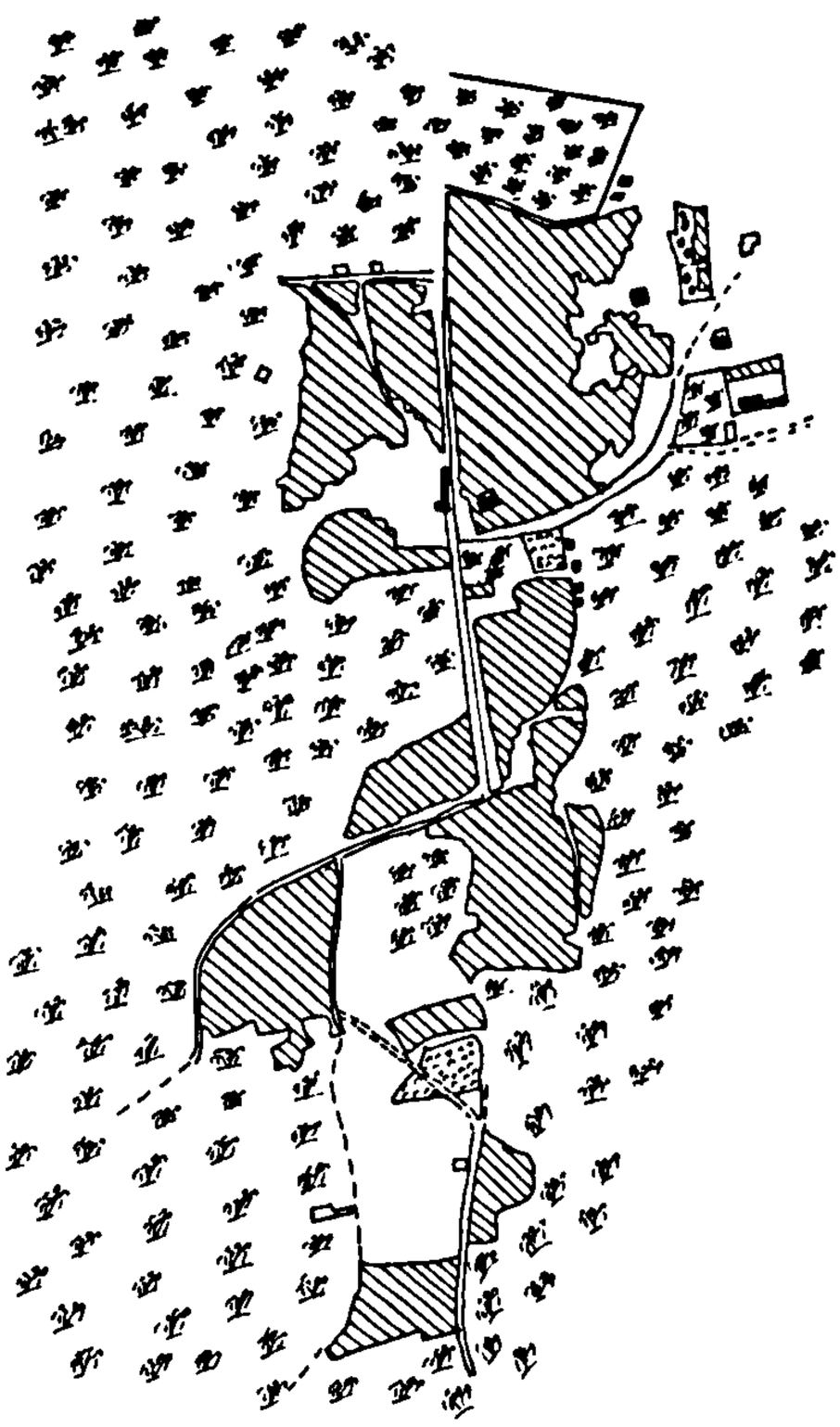


FIG. 8 33 - 1950

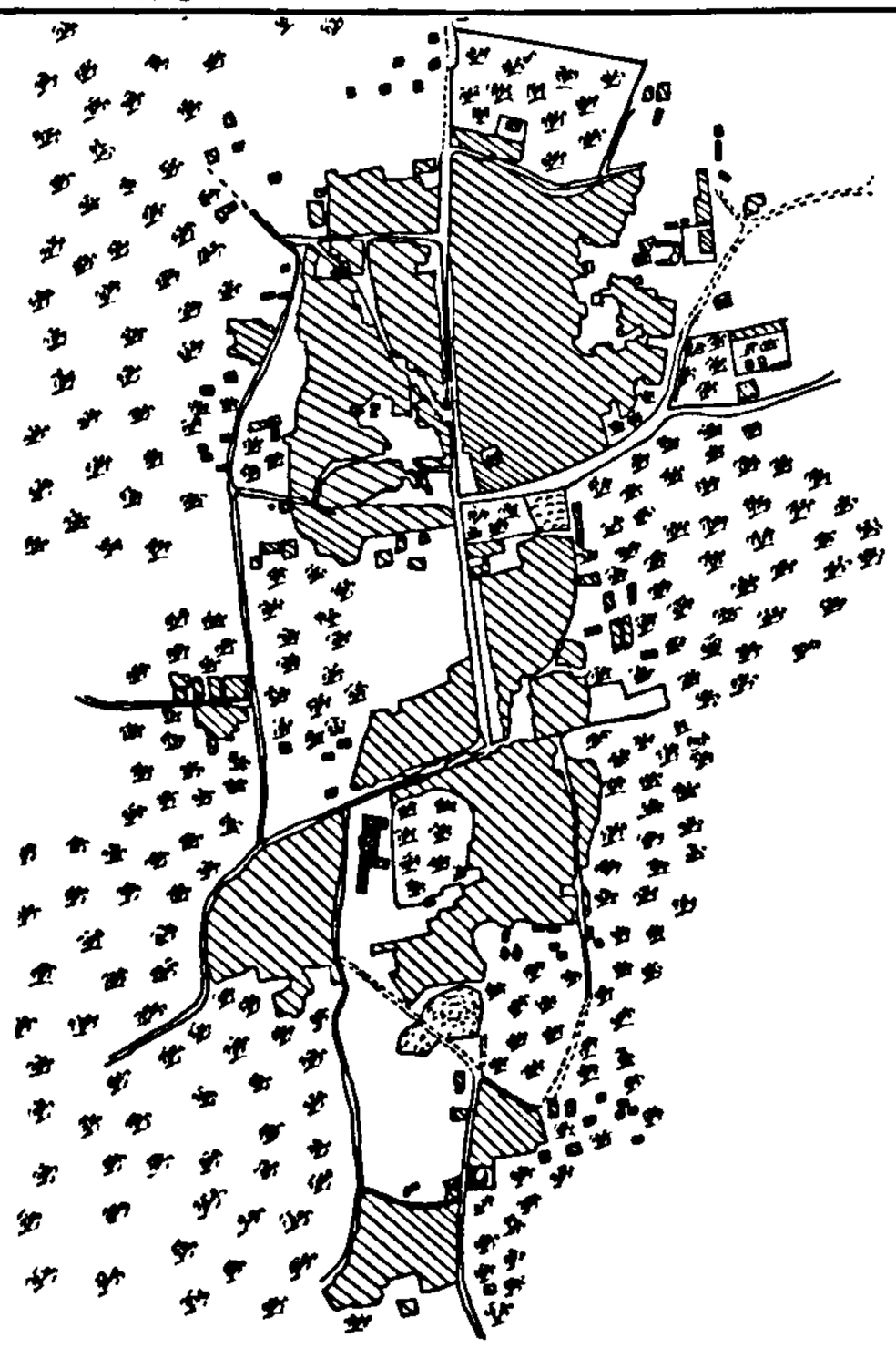


FIG. 8.34. - 1960

QATIF EXPANSION IN 1934, 50 & 60

LEGEND

- RESIDENTIAL AREA
- SCHOOLS
- ADMINISTRATION
- HOSPITAL
- MOSQUE
- PLANNED STREET
- DATE GARDENS
- CEMETERY
- OPEN SPACE

N

150 0 150 300 450
metres

6 -72. A. M. AL-SHUAIBY

The map of 1970 (Fig. 8.35) shows still groater expansion in the residential areas; new plans have been drawn up for the whole town, with wider and better designed streets, and Qatif now has new asphalt roads linking it with other towns and villages in the Eastern Province.

Housing

Many centuries ago, architecture and design was influenced by the palm trees, and access from the sea. Houses in Al-Qatif were normally built from stones, mud and limestone, with roofs, windows and doors made from the leaves and bark of the palm tree. Stones and mud were collected from the sea shore and the Sabakhat and strengthened by blending with straw, as in other old Arabian towns and villages. Houses were mostly one-storey and the plan of the house was dictated by the available floor space. Normally, houses had a half-roofless sitting room (for ventilation in the summer), sometimes another similar room to be used as a guest room, a central courtyard for use as a family room, and around these, a kitchen, bathroom and other rooms. Windows were narrow, and placed high up to afford protection from wind and sand.[26] Interior decoration was normally done in gypsum. Recently, many old houses have been re-designed and converted to two or even three-storey buildings, and stones and cement have been used in these conversions, instead of the traditional building materials. (See Table 8.21)

TABLE 8.21
BUILDING MATERIALS USED IN QATIF (1972)

Materials	Construction	Alteration	Compounds	Total	%
Cement	81	80	5	166	15.3
Stones	351	505	49	905	83.6
Mud	-	-	-	-	-
Block and Bricks	5	5	2	12	1.1
Others	-	-	-	-	-
TOTALS	437	590	56	1083	100

Source: Ministry of Finance, Central Department of Statistics

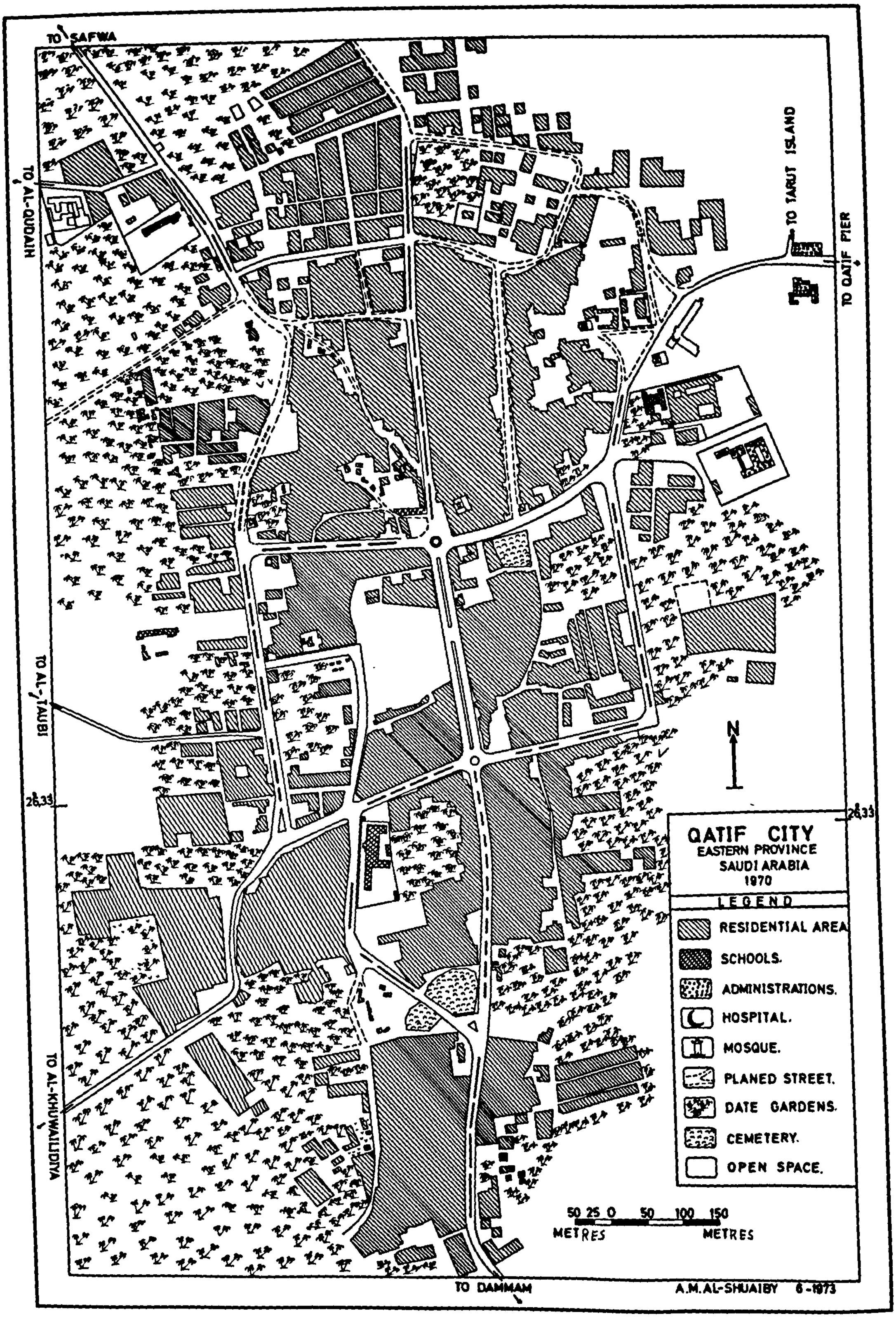


FIG. 8.35 QATIF, EXPANSION IN 1970.

Windows and doors in the modern buildings are much wider (not less than 1 metre), often with balconies and more metal is used in their construction (See Fig. 8.36)

The Streets

The town has one central main street, near Al-Qal'ah Quarter, and streets from other quarters converge on this main street almost at right angles. Traffic entering and leaving Qatif from and to the north was this main street as an arterial route. Other traffic is fairly evenly distributed along five other less important routes. The roads are asphalted, footpaths are paved and streets are well lit. (See Streets, Chapter 8, Introduction).

Qatif Harbour

At present the harbour, one pier to the north-east of Qatif, is very small. In earlier times (Qatif's 'golden era') when Qatif was a market town serving North-eastern Arabia and the Oasis itself, it was the chief port on the Arabian Gulf. In 1905, about 13 pearling boats owned by residents of Qatif operated from the pier, but in spite of its importance it did not compete with Oquair for foreign trade from Al-Hasa Oasis in the early 20th century. Due to its shallow coastal waters, extending outward for about 15 Km. Qatif pier has more recently been used only by small fishing boats and for the export of dates from the region. It is also used as a landing place for pilgrims to the region.

Future developments are planned for the port, but the towns of Qatif and Jubail have been chosen on a preliminary basis as the sites of further development for Saudi Arabian Gulf ports.[27]

Commercial Activities

History tells us that Qatif City was the main commercial centre in the East of Arabia and with Hofuf in Al-Hasa Oasis was a traditional

FIG.8.36. OLD AND NEW HOUSES IN QATIF.

entrepoint in a trading framework with three elements:

1. Bahrain; largest (NB long-distance trade)
2. Tarut; mainly secondary function to Bahrain.
3. Al-Qatif; part independent, part secondary function to Bahrain.

Due to the production of dates in commercial quantities, Qatif had a good trade in dates, date syrup, date branches (for firewood), reeds (for mat making) and hides to the Gulf countries and others.

In 1905 exports through Qatif Pier to Gulf States, Persia and India (via Bahrain) were mainly dates and by-products of dates.[28] (See Table 8.22)

TABLE 8.22
DATE EXPORTS FROM QATIF (1905)

Quantity (tons)	Destination	Remarks
2500	Bahrain	For local consumption in Bahrain
12500	Oman and Persia	
4000	India, partly direct and partly via Bahrain	Soiled dates
5000	Local consumption in Qatif Oasis	

Source: Lorimer, 1905

Qatif gradually lost its importance as a trade centre in the Eastern Province, particularly during the oil period. The most important factor in this decline was the construction of the large modern port at Dammam, the first commercial centre, and at Al-Khobar the secondary commercial centre of the Province. Both ports affected the former monopoly of Qatif as port for the northern area of the Province.

Recent economic activities in Qatif have brought it recognition as a fourth ranking commercial centre of the region, after Dammam, Al-Khobar and Hofuf. New commercial and industrial establishments reflect its expansion since the discovery of oil and the resultant improved transport facilities in the region, and in 1971 there were 7.1% more industrial establishments than in 1967.[29] (See Table 8.23).

TABLE 8.23
GROWTH IN NUMBER OF ESTABLISHMENTS IN QATIF

Elements	1967	1971	Rise	% Increase
Establishments	793	849	56	7.1
Workers	1061	1197	136	12.8
Average number of workers per establishment	1.3	1.4	0.1	-

Source: Ministry of Finance, Central Department of Statistics

Although Hofuf and Qatif are both ancient urban centres, Hofuf has many more industrial and commercial establishments (2249 compared with 849), probably due to the greater population and general economic importance of Al-Hasa Oasis. In Qatif there is a greater percentage of commercial establishments (79.4%) and industry accounts for only 20.1% of the total, the remainder being transport and storage businesses.[30] (See Table 8.24 showing the size and type of establishments in Qatif).

TABLE 8.24
SIZE AND TYPE OF ESTABLISHMENTS IN QATIF (1971)

Establishments	Number	%	Employees	%	Average Number of Workers per Establishment
Commercial	674	79.4	870	72.7	1.3
Industrial	171	20.1	320	26.7	1.9
Transport and Storage	4	0.5	7	0.6	1.8
TOTALS	849	100	1197	100	1.4

Source: Ministry of Finance, Central Department of Statistics

Almost all the commercial establishments are small private companies, owned by local inhabitants, mainly restaurants and financial, construction and business services. Retail shops include clothing, furniture, carpets, grocery, building materials and motor spares, and wholesale warehouses for clothes, foodstuffs, drinks and tobacco. Financial enterprises include banks and money changing shops; the services include agencies, business and social services. Retail

establishments account for about 75.7% of the total commercial establishments in Qatif (See Table 8.25), and provide a wide range of services to the city and its surrounding area of Qatif Oasis settlements. Commercial trade in Qatif has been affected by its close proximity to Dammam (18 Km.) and buying is on a small scale, as many people travel to Dammam once or twice a week to take advantage of the wider variety of goods and services. The quantitive measurement of inter-urban movements for shopping was not possible in the time available since this would require a very large sampling of a large and complex flow of motor traffic and the questioning of occupants. A major survey of this kind however would be valuable both for analysis of the present and for planning. The weekly Thursday market (Suq Al-Khamis) produces high retail and wholesale trade activity on this day, the only market day in the Eastern province towns.

TABLE 8.25
DISTRIBUTION OF COMMERCIAL ESTABLISHMENTS IN QATIF (1971)

Establishment	Number	%	Independent Establish-ments	Main Centre of Establish-ments	Branches of Establish-ments
Wholesale	38	5.6	25	3	10
Retail	510	75.7	470	18	22
Restaurants	18	0.8	18	-	-
Financial	5	0.8	2	-	3
Construction	7	1.0	7	-	-
Services	96	14.2	89	1	6
TOTALS	674	100	611	22	41

Source: Ministry of Finance, Central Department of Statistics.

Classification of commercial establishments by number of employees shows that 81.9% have only one employee, 17.1% have two and the remainder have between 5 and 19 employees. (See Table 8.26)

Most workers in commercial establishments (about 82.6%) in 1971 were unpaid, i.e. were self-employed proprietors or members of proprietors' families, and a similar situation applies to most industrial establishments (See Table 8.27).

TABLE 8.26

CLASSIFICATION OF COMMERCIAL ESTABLISHMENTS BY NUMBER OF EMPLOYEES (1971)

Establishment	1	2-4	5-9	10-19	20-49	50-99	100+	Total
Wholesale	29	9	-	-	-	-	-	38
Retail	438	72	-	-	-	-	-	510
Restaurants	9	8	1	-	-	-	-	18
Finance	2	1	1	1	-	-	-	5
Construction	6	1	-	-	-	-	-	7
Services	68	24	2	1	-	-	-	96
TOTALS	552	115	5	2	-	-	-	674
Percentages	81.9	17.1	0.7	0.3	-	-	-	100

Source: Ministry of Finance, Central Department of Statistics

TABLE 8.27

TYPE OF EMPLOYEES IN COMMERCIAL ESTABLISHMENTS (1971)

Establishments	Unpaid	Wage Paid	Total
Wholesale	38	14	52
Retail	534	68	602
Restaurants	22	13	35
Finance	2	19	21
Construction	7	1	8
Services	116	36	152
TOTALS	719	151	870
Percentages	82.6	17.4	100

Source: Ministry of Finance, Central Department of Statistics

Industrial Activities

As Qatif City has been an urban centre for the Oasis, the industrial units were very small, e.g. workshops of handcrafts, motor repairs, ware makers, carpentry, soft drinks, ice, foodstuffs, electricity and others. The total number of industrial establishments in 1971 was 171, or 20.1% of the total in Qatif. The soft drinks, ice and foodstuffs factories occupy first place among industrial establishments (about 28%); second the textile and clothing manufacturers (24.6%) and third carpentry and furniture. (See Table 8.28).

The classification of industrial establishments by number of employees shows that about 96.0% of them employed only one or two workers, and very few employed more than two, reflecting the size of manufacturing or workshops in

TABLE 8.28
DISTRIBUTION OF INDUSTRIAL ESTABLISHMENTS
AND TRANSPORT AND STORAGE (1971)

Establishment	Number	%	Independent Establish-ments	Main Centre Establish-ments	Branches
Soft Drinks, Ice and Food	49	28.0	48	-	1
Textile & Clothing Makers	43	24.6	39	3	1
Carpentry and Furniture	40	22.9	38	-	2
Metal Workshops	32	18.3	32	-	-
Electricity	1	0.6	-	-	1
Other Industries	6	3.4	6	-	-
Transport & Storage	4	2.3	1	1	2
TOTALS	175	100	164	4	7

Source: Ministry of Finance, Central Department of Statistics

TABLE 8.29
CLASSIFICATION OF INDUSTRIAL ESTABLISHMENTS
(INCLUDING TRANSPORT AND STORAGE)
BY NUMBER OF EMPLOYEES (1971)

Establishment	1	2-4	5-9	10-19	20-49	50-99	100+	Total
Soft Drinks, Ice and Food	24	22	2	-	1	-	-	49
Textile & Clothing Makers	34	9	-	-	-	-	-	43
Carpentry and Furniture	28	10	2	-	-	-	-	40
Metal Workshops	16	15	1	-	-	-	-	32
Electricity	-	-	1	-	-	-	-	1
Other Industries	1	5	-	-	-	-	-	6
Transport & Storage	2	2	-	-	-	-	-	4
TOTALS	105	63	6	-	1	-	-	175
Percentages	60.0	36.0	3.4	-	0.6	-	-	100

Source: Ministry of Finance, Central Department of Statistics

Qatif (See Table 8.29).

About 60.2% of all industrial employees in 1971 were unpaid, again reflecting the limited capital investment available in Qatif. (See Table 8.30).

TABLE 8.30

TYPE OF EMPLOYEE IN THE INDUSTRIAL ESTABLISHMENTS (1971)

Establishments	Unpaid	Paid	Total
Soft Drinks, Ice & Food	58	62	120
Textile & Clothing Makers	46	9	55
Carpentry & Furniture	46	18	64
Metal Workshops	38	20	58
Electricity	-	5	5
Other Industries	4	14	18
Transport and Storage	5	2	7
TOTALS	197	130	327
Percentages	60.2	39.8	100

Source: Ministry of Finance, Central Department of Statistics

Distribution of Special Functions

As the principal urban and service centre of the oasis, Qatif has many special functions, and is the home of the government offices, the Emirat of Qatif Oasis, and many other private offices. Qatif is the shopping centre for the oasis villages and towns, and the Thursday market, Suq Al-Khamis, attracts large crowds. These functions emphasise Qatif's importance to the people of the oasis, and paved roads link it with all the towns of the oasis as well as with Dammam the main administrative centre of Eastern Province.

1. Qatif City as the Administrative Centre for Qatif Oasis

Qatif City is the sub-central administrative centre for the oasis; the governor's residence is in the east of the old town of Al-Qal'ah, on the road to Qatif Pier. The main post office and the municipal offices are located in the main street at the city centre, near the old quarter of Al-Qal'ah.

2. Qatif City as a Shopping Centre

The main shopping street runs north to south in the centre of the city. Both sides of the street are lined with retail shops selling food, clothing, furniture, building materials, hardware, jewellery and

gold, as well as tailors, grocers and drugstores. A few wholesalers are found in the areas around the main street, and government and business offices are situated in the centre of the main street. (See Fig. 8.37). Carpenters, blacksmiths, gas dealers and the General Hospital are in the northern and southern extremities of the main shopping street, and shops retailing meat, fish, fruit and vegetables are spread around the city's four covered markets. About 34% of the city's 321 shops are in its main street.[31] (See Table 8.31 and also Fig. 8.38, showing type of shops in central Qatif).

Public Utilities

1. Water

Water in Qatif City is salty, the degree of salinity varies as the aquifers rise closer to the surface as a result, Qatif is one of the five cities which will benefit from the new desalination plant at Al-Khobar, and will have water piped from this plant in 1976.

2. Sewage

Qatif has no modern sewage system, and no plans have yet been made for the provision of this facility.

3. Electricity

Electric power in Qatif is supplied from the Dammam substation, of Dhahran District main power station. In 1973 domestic, commercial and industrial use consumed 3495 units, a 49% increase on the 1967 figure. 70.7% of the consumers were domestic, 22.5% commercial and 1.0% industrial; 4.3% was used for street lighting, government offices, schools, mosques and other public buildings, and the reamining 1.5% was used for miscellaneous purposes.[32] (See Table 8.32)

TABLE 8.32
ELECTRICAL CONSUMPTION IN QATIF (1973)

Consumer	Number	%
Domestic	2470	70.7
Commercial	787	22.5
Industrial	34	1.0
Public Utilities	152	4.3
Others	52	1.5
TOTALS	3495	100

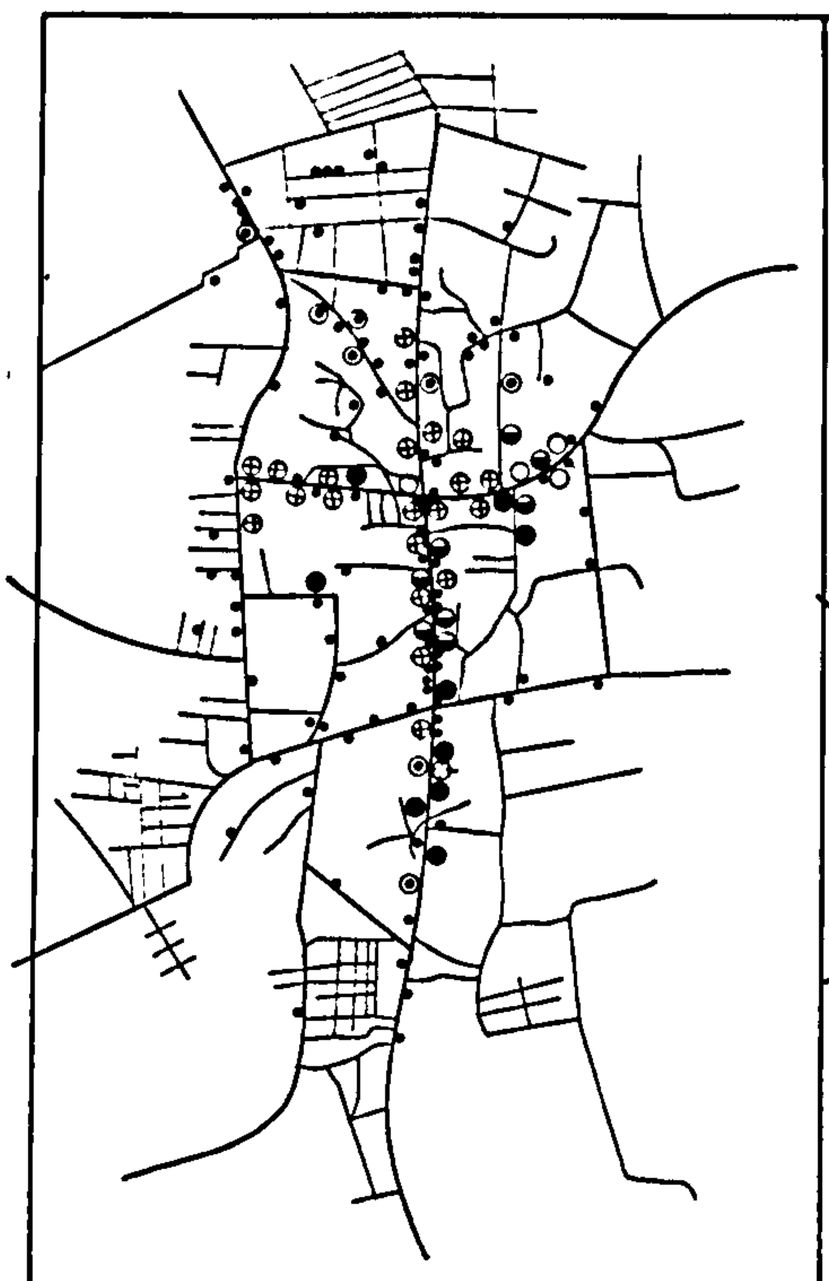
Source: Fieldwork, Summer 1973

The main street.

Suq Al-Khamis.

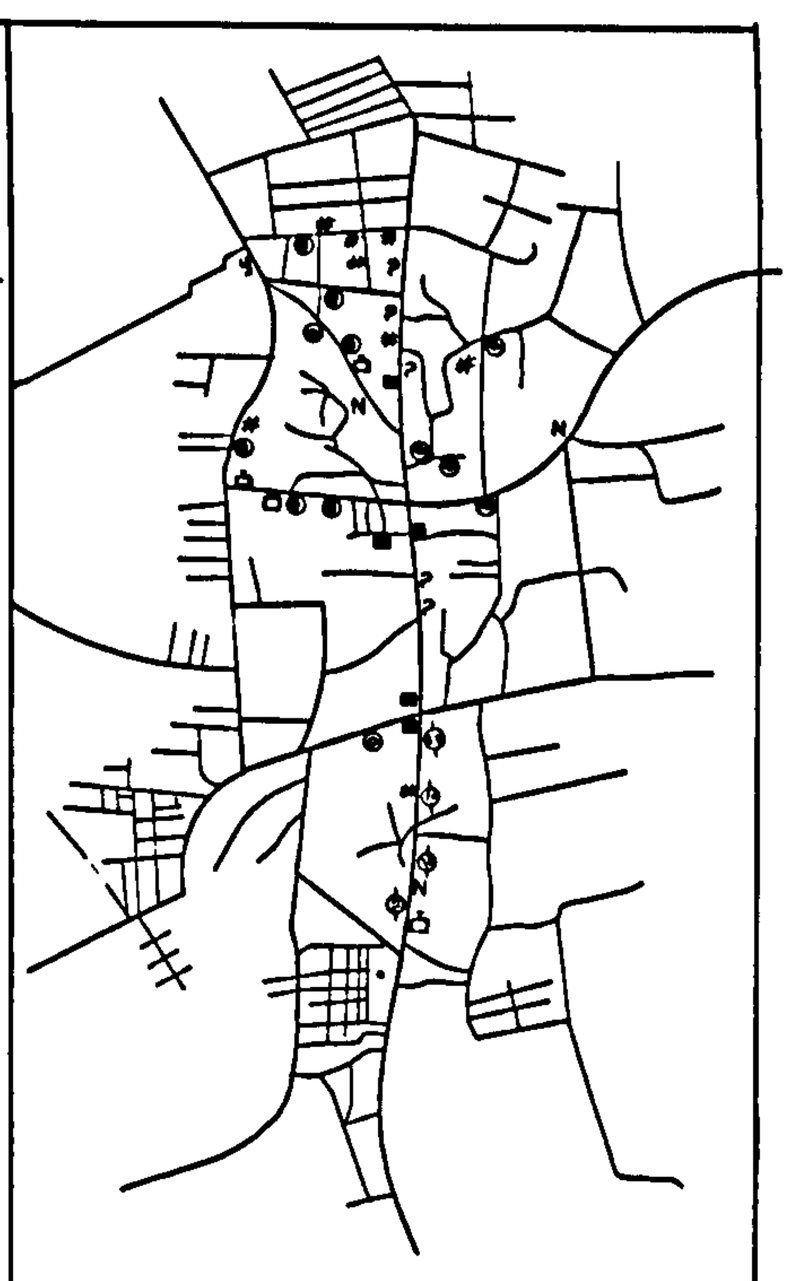
Suq Al-Khamis.

FIG.8.37. QATIF SHOPPING CENTRE.



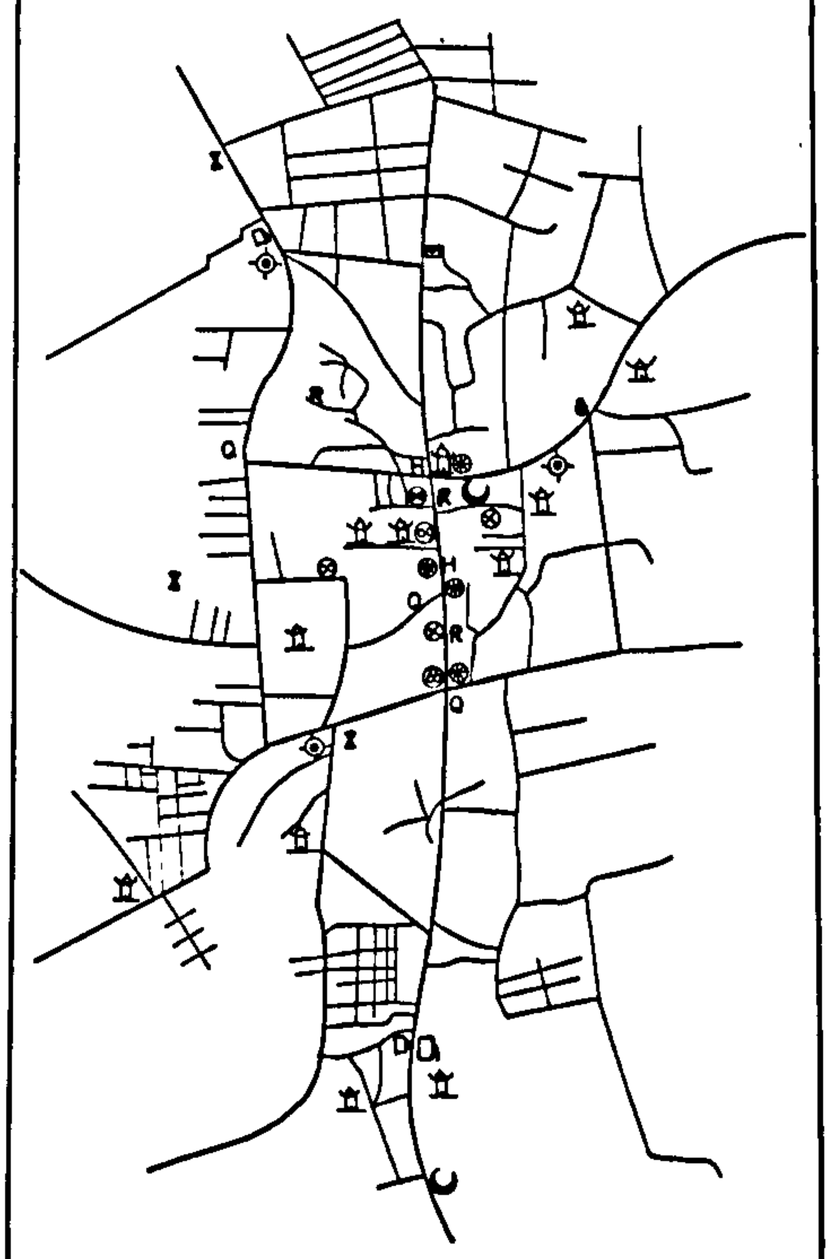
○ WHOLESALE FOODSTUFFS. ◉ BAKERS
◐ RETAIL FOODSTUFFS. ◇ DATES
◒ GROCERIES • MISCELLANEOUS SHOPS
● GREENGROCERIES

▬ CLOTHES & SHOES. ▲ ELECTRICAL GOODS. ◍ GOLDSMITHS.
▭ CLOTH. ▲ FURNITURE. ◑ CHEMISTS.
▭ TAILORS. ▲ SEWING MACHINE SHOP. ∞ BOOKSHOPS
+ KITCHEN WARE. ● JEWELLERY & WATCHES.



◐ RESTAURANTS. # BUILDING.
◒ COFFEE SHOPS. N. GAS DEALERS.
▭ PHOTOGRAPHERS. ɣ MOTOR SPARES.
▭ LAUNDERERS. ◈ HARDWARE.
? MEN'S HAIRDRESSERS.

R HANDCRAFTS ♣ REPAIRS
T JOINERS. ▭ GARAGES
✝ CARPENTERY. ▬ UPHOISTERERS.
♣ BRICKS & BLOCKS. ▭ ICE PLANT



⊗ TRAVEL AGENTS. ✉ POST OFFICE. ● SURGERIES.
◒ COMPANIES. Ⅱ SCHOOLS. ⛪ MOSQUES.
H BANKS. ☾ HOSPITAL/CLINIC ✥ TRANSPORT STATION
Q GOVERNMENT OFFICES. 🔥 FIRE STATION. ⛽ PETROL STATION
● ESTATE AGENTS. R SPORT HALL.

FIG. 8.38 DISTRIBUTION OF SHOPS, WORKSHOPS, OFFICES, AND SOCIAL SERVICES IN QATIF. (1973)

0 200 400 600 800 1000
metres

N

TABLE 8.31

BUSINESSES IN THE CENTRE OF QATIF (1973)

Group No..	Type of Shops	Main Street	Sharia Street	Bab Al-Shamal	Madaris	Al-Dubaibiyah	Total
1.	Wholesale Foodstuffs	-	3	1	-	-	4
2.	Retail Foodstuffs	12	8	1	36	-	56
3.	Groceries	6	5	-	-	-	11
	Greengroceries	7	4	-	1	12	
	Bakers	2	1	3	1	1	8
	Dates	1	-	-	-	-	1
4.	Clothes and Shoes	2	-	-	-	-	2
	Cloth	1	1	-	-	1	3
	Tailors	4	1	1	1	-	7
5.	Kitchen Ware	2	3	-	-	-	5
	Electrical Goods	5	1	1	1	-	8
	Furniture	1	1	-	-	2	4
	Sewing Machine Shops	-	-	-	1	-	1
6.	Jewellers and Watches	-	1	-	1	-	2
	Goldsmiths	-	1	-	-	-	1
7.	Chemists	3	1	-	-	-	4
	Bookshops	2	-	-	1	-	3
8.	Restaurants	-	-	4	2	-	6
	Coffee Shops	-	4	1	-	1	6
9.	Photographers	4	-	-	1	-	5
	Launderers	1	-	2	1	-	4
	Men's Hairdressers	5	-	1	5	-	11
10.	Building Materials	2	1	5	-	-	8
	Gas Dealers	1	1	1	-	-	3
	Motor Spares	-	-	1	-	-	1
	Hardware	4	-	-	-	2	6
12.	Miscellaneous Shops	41	14	55	13	13	136

TABLE 8.31 (continued)

Type of Workshops	Main Street	Sharia Street	Bab Al-Shamal	Madaris	Al-Dubaibiyah	Total
Handcrafts	-	-	-	1	-	1
Joiners	3	-	-	2	1	6
Carpenters	-	-	-	-	3	3
Bricks and Blocks	-	-	1	3	-	4
Repairs	7	5	11	2	1	26
Garages	-	-	2	-	4	6
*Upholsterers	3	-	2	-	-	5
Ice Plant	-	1	-	-	-	1
Type of Offices						
Travel Agents	1	-	-	1	-	2
Companies	-	-	-	1	-	1
Banks	2	-	-	-	-	2
Government	1	-	1	1	-	3
Estate Agents	-	-	-	1	-	1
Post Office	1	-	-	-	-	1
Types of Social Services						
Schools	-	-	-	-	1	1
Hospitals/Clinics	1	1	-	-	-	2
Fire Station	-	1	-	-	-	1
Sports Hall	2	-	1	-	-	3
Surgeries	3	1	-	-	-	4
Mosques	1	-	1	-	-	2
Transport Stations	-	1	-	-	1	2
Petrol Stations	2	-	1	-	-	3
TOTALS	136	64	96	76	30	402

Source: Fieldwork, 1973

*Including traditional 'monajjid' makers and repairers of cotton mattresses, pillows and upholstered goods.

Social Facilities

Schools (see Table 8.33)

Hospitals

Qatif has one 100 bed hospital and an outpatients' clinic and school health centres. The hospital is located in the south, in the main street of Al-Qatif and the clinic is in Shari'ah Quarter, to the south of Al-Qal'ah. There are also four retail drug stores, three in the main street and the fourth in Al-Shariah Quarter. In the centre of the main street there are four private doctors' surgeries, usually open all day from 9.00 am to 9.00 pm.

Hotels

There are no hotels in Qatif, probably due to its limited function in the Eastern Province, and the short distance between Qatif and Dammam, as business people can travel from Dammam to Qatit and back in the same day.

Banks

Qatif has two banks, the Saudi National Commercial Bank and the Cairo Bank, both situated in the main street.

Religion

About 95% of the population in Qatif are Shi'iah and 5.0% are Sunni including the governor and some of his staff and several people not Qatifees. There are approximately 15 mosques in Qatif, 12 Shi'iah and 2 Sunni mosques, and the main Sunni Friday mosque is in the south-west of Al-Qal'ah Quarter.[33]

Transport Stations

The tity has two bus stations, one for the bus serve to Rahimah town, situated in the north-west of Qatif, in Bab Al-Shamal. The other is the main transport centre, and is situated in the south-west of Qatif. In addition to this, taxis operate within the city, stopping in the main street.

Parks

Unlike other cities in the Province, Qatif has no specific parks, although there are many date gardens in the city and its surrounding

TABLE 8.33

DISTRIBUTION OF SCHOOLS AND PUPILS AND THE CHANGES BETWEEN 1970 and 1972 IN QATIF

LEVELS	SCHOOLS								PUPILS							
	1970			1972			Change		1970			1972			Change	
	B	G	T	B	G	T	No.	%	B	G	T	B	G	T	No.	%
Elementary	5	2	7	5	3	8	1	14.3+	2453	1358	3811	2733	1671	4404	593	15.6+
Intermediate	2	1	3	3	1	4	1	33.3+	492	228	720	531	282	813	93	12.9+
Secondary	1	-	1	1	1	2	1	100.0+	221	-	221	221	104	325	104	47.1+
Evening Class	1	-	1	1	-	1	-	-	30	-	30	108	-	108	78	260.0+
Blind Institute	1	-	1	1	-	1	-	-	111	-	111	112	-	112	1	0.9+
TOTALS	10	3	13	11	5	16	3	23.1+	3307	1586	4893	3705	2057	5762	869	17.8+

Source: Ministry of Education and the Presidency for Girls Education

areas, normally used by the public as parks.

Cemeteries

Qatif has two cemeteries, one in the north of Al-Shariah Quarter, near Al-Qal'ah, and the second in the south of Al-Kuwaikib Quarter, south-west of Qatif. Both are very old, and the oldest in Sharia'ah Quarter was used by citizens of the old city of Qatif, the other by the surrounding area.

Qatif may summarily be described as a small-scale version of Hofuf. In the oasis area as a whole 73.5% of the population was classified as urban in 1962/63, with Qatif city itself having an estimated 50% of the oasis population in 1970. The city's population growth rate has been consistently higher than that of Hofuf as a result of the "spin-off" effect on residential development from nearby oil-field development. The same proximity has however discouraged growth in economic activity in Qatif as compared with neighbouring Dammam and Al-Khobar. It retains its traditional functions for Qatif oasis but for the Midland region its main function is as a place of residence for people who work in Dammam and to a lesser extent in Dhahran and Ras Tannura.

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C. DAMMAM

1. Location and Site

Dammam lies on a sandy, narrow storm beach, a terra in complex which is frequently associated with coastal settlement on the Arabian Gulf shore, and one characterising both Dammam and Al-Khobar. From the shallow water of the sea rises a discontinuous storm beach ridge, sometimes broken by creek systems, where permeating fresh water mixes with sea brine to form coastal marshes. Quite different are the Sabkhat flats of saline silt, which generally extend over long and small depressions at approximately near sea level behind the narrow, low coastal sand ridge. Inland from the Sabkhat are found the higher rock and sand dry land areas, with morphology dictated by lithology and wind action.

The shore is reef and shallow water for about 8 km. out to the sea; only native boats can approach the shore, and the main feature of this shore is the small island on which stands the famous fort of Dammam.

2. Historical Outline

The first record we have of Dammam dates back to the eighteenth century, when it appears as a small coastal village, more famous for its island fort (Fig. 8.39) which lay half a mile off-shore, than for anything else. This fort was built by the notorious Arabian mariner Rahmah bin Jabir, of the Atbi tribe; the island had previously been occupied, but nothing is known of this earlier period. The leader of an Atbi clan which had settled on the coast, Rahmah bin Jabir was the ruler of Dammam in the late eighteenth century and died in 1826.[1] The fort itself lay on an off-shore reef in Tarut Bay, almost joined to the mainland at low tide; there were three other small forts in the settlement, one of them containing a spring of good water; these forts were used as defence points for Dammam. There were no date gardens in Dammam in the early nineteenth century.[2]

After the death of Rahmah bin Jabir and during the nineteenth

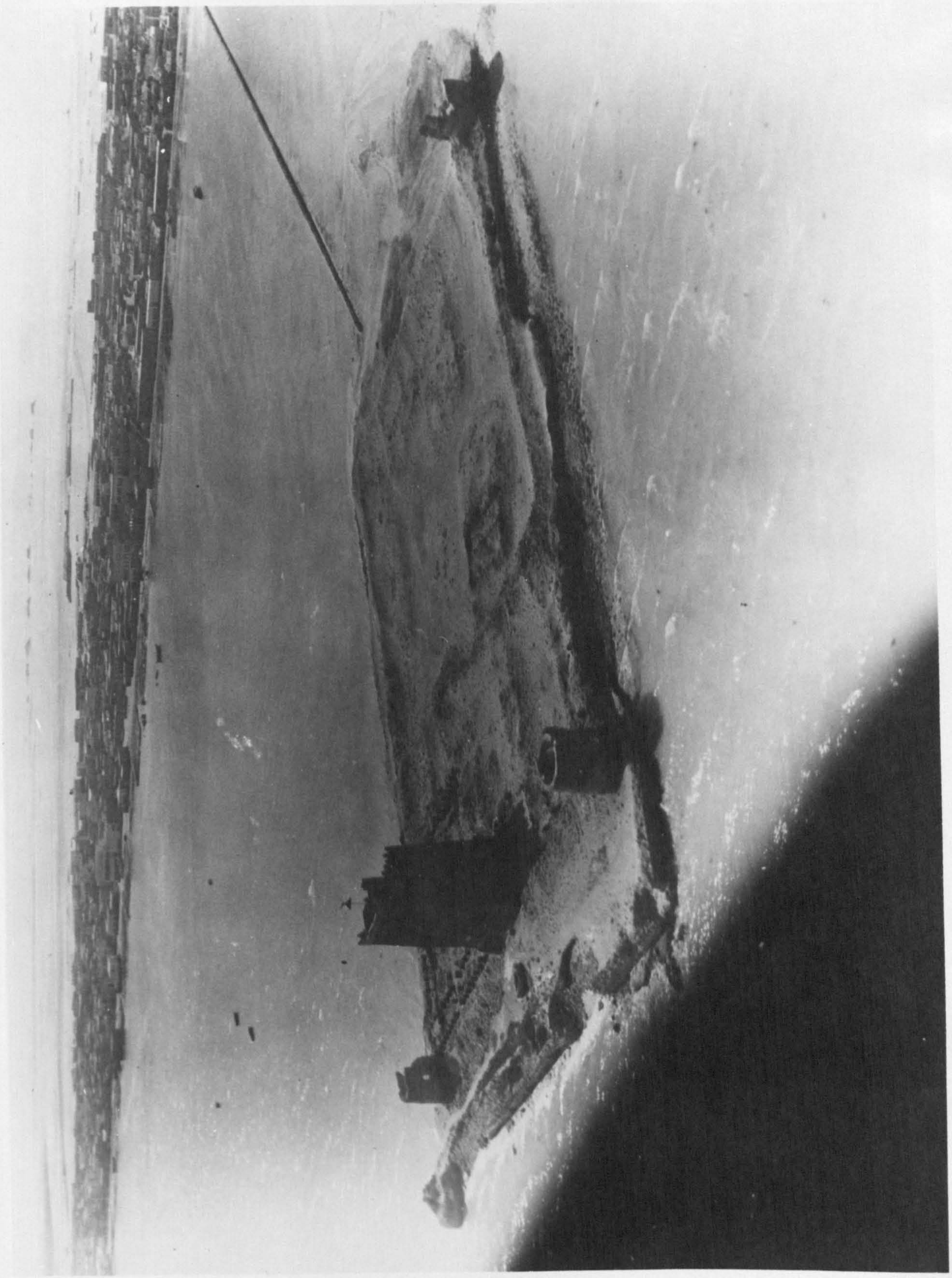


FIG.8.39. THE OLD ISLAND FORT IN DAMMAM.

century, Dammam was exposed to many raids from neighbouring peoples. Its people dispersed and the village lay ruined and deserted, and no-one lived there until 1921, when the Dawasir tribe immigrated from Buddi'a in Bahrain.[3] In an interview (made during fieldwork in Summer 1973) with an old man from Mubarraz in Al-Hasa Oasis who lived in Dammam, he told me the following story of the Dawasir emigration: "Dammam was the ruined remains of the old village of Rahmah bin Jabir. Before the Dawasir emigrated to that area, it was periodically inhabited by Bedouins, who stayed for short periods during the year. In 1921 about 200 Dawasir emigrated from Bahrain Island and settled in Dammam and Al-Khobar; the group who went to Dammam had a chief named Abdulla bin Hassan, and the second who settled in Al-Khobar had a chief called Mohammed bin Rashid. The original settlers were simple people with a low standard of living, and the first Dawasir settlements consisted of huts made from mud and palm trees - the only available materials at that time. The people eked out a living by fishing and pearl diving. The hard struggle for existence caused many of the Dawasir to return to Bahrain, though some managed to remain in Dammam and Al-Khobar until the discovery of oil in the region in 1938. After the discovery of oil, many obtained work as labourers in the oil industry, for a daily wage of 0.25-1.00 Indian Rupees".[4]

In 1938, the great year for Dammam and for the whole of Saudi Arabia, oil was discovered in quantities sufficient for commercial production. Oil flowed from Well No. 7 at Dammam Dome, and from this time the face of Dammam has changed completely, and it has become a modern city, and the capital of the Eastern Province.

4. <u>The popualtion and its growth</u>

The emigration of Dawasir people from Bahrain Island to Dammam and Al-Khobar on the western coast of the Arabian Gulf, was the beginning of both cities.

The Dawasir (originally part of the Dawasir tribe) came originally

from Southern Najid in the Arabian Peninsula. They migrated to the Arabian Gulf countries (particularly Bahrain) in 1845, and settled at Al-Biddi'a[5] in the north-west and in Az-Zallag in the west of Bahrain, and in general they were sedentary settlers rather than pastoral nomads, and became pearl fishers and farmers, cultivating dates.

The Dawasir chose Dammam and Al-Khobar for their new settlement for the following reasons. First, Dammam was a known settlement site, with its famous fort and potable water; secondly, Dammam and Al-Khobar were the nearest unoccupied sites to Bahrain on the coast suitably situated for the pearl fishing in the Gulf. Third, they were not too distant from the main pearl markets, and lastly, geographically the location, weather and life-style were similar to those which the Dawasir tribe had become accustomed to.

The Dawasir began to rebuild Dammam, and its population increased at a faster rate than that of Al-Khobar, and in 1935 there were approximately 1350 people living around the old small port of Dammam. When oil was discovered in the region Dammam rapidly grew to become the large administrative, commercial and industrial centre for the whole of the Eastern Province. The population of Dammam is more local than that of Al-Khobar, which is the home of most of the American and European employees of the oil company. During the period 1935-56 the population increased to 12,000; a further rapid increase occurred between 1956-62, when the population rose to 22,000 with a growth rate of 83.3%. Rapid increases also occurred during the period from 1962-70, when the population increased to 43,000 with a growth rate of 95.5% (See Table 8.34).

It can be seen that the numbers rose rapidly after the commercial discovery of oil in 1938. The highest percentage increase was noted during the third period of growth (1962-70), due to the increasing influence of oil and associated industries along with increased commercial activities.

TABLE 8.34
THE GROWTH OF POPULATION IN DAMMAM

Year	Population	Percentage Increase	Period
1935	1,350		
1956	12,000	788.9	1935-56
1962	22,000	83.3	1965-62
1970	43,000	95.5	1962-70

Source: Aerial photograph analysis (personal estimation).

The centralisation of economic activities has made Dammam the target for extensive building programmes; it is strategically located at the terminal point of the Dammam-Riyadh railway, and has one of the finest ports on the Arabian Gulf. Many of Dammam's inhabitants are merchants, some of whom act as commercial agents and importers and distributors; other residents include the owners of both large and small businesses.

5. Old and New Dammam

In general, Dammam in 1935 was rectangular-shaped, and lay parallel to the shore line, compressed on the storm beach ridge. The outline of the village was incoherent, related to the relatively simple functional demands made by a small traditional society with no farmland and only animal transport.

Some street alignment can be clearly seen in the north and the north-western parts of the village. Two relatively long streets give some grid pattern to an otherwise irregular arrangement. The houses were more densely arranged in the west and the east, where there were more dispersed houses. The main core of the traditional village lay in these densely occupied western areas around the market. The market itself consisted of a small group of shops along one of the central cross streets, but it was not sufficiently

important for any regular market day to be established in the way in which market development had already occurred in Qatif further to the north. In the 1930's the people of Dammam went to Qatif for their shopping.

The main exits and entrances of the village - too small to be thought of as gates - were nearly all on the western side of Dammam. There were about ten mosques, most of which were situated in the central area of the village.

When the Dawasir tribe came to Dammam for the first time they constructed huts of palm leaves and palm trunks, except for the island fort. After some years, uncontrolled development of building took place, owing to the desire of the people for better dwellings. The buildings and the huts in all cases consisted of a large central courtyard, with rooms on one side of the courtyard. These rooms were usually arranged to face the north and north-west to take advantage during the hot, damp summer, of the movement of cool night air. The rooms were usually two to five in number, sometimes more, depending on the number of the family. The buildings, made of mud and stones, were one-storeyed with the exception of the island fort, which had three floors. The height of the roof in the houses was between two and three metres, and rarely more than three metres; the walls inside the rooms were plastered.

Dammam in the 1930's was, in all ways, a traditional, small Arabian village.

Growth of Dammam

After the discovery of large quantities of oil in the Eastern Province in 1938, a new phase of life began for Dammam which caused a gradually increasing activity. The people of the small fishing village of Dammam (Fig. 8.40, photo 1935) had, with few exceptions, left their occupation of pearl fishing and lost their traditional skill; but after 1940, and during the Second World War, the tempo of oil prospecting slowed down and Dammam changed very little during this period.

FIG.8.40. DAMMAM IN 1935.

The real change came as a result of the discovery of oil after the Second World War, about 1950, and Dammam became the target for three types of immigrant, Arab and non-Arab. The Arabs came from various Arab countries in general and from Saudi Arabia in particular. The non-Arab immigrants came from other parts of the world such as America, Europe and other countries. They came for three reasons:

(a) as employees, to join the oil companies;

(b) as merchants, to establish commercial enterprises;

(c) as business people, to provide new firms, professional and contracting.

The increasing needs for new buildings in the region made the port of Al-Uqair, which was the chief port of the region, too inaccessible from the oil field, and it proved inadequate for the quantities of material being shipped in for the oil fields. The government chose the Dammam area as the best location for a deep water terminal. The new port-terminal facilities were constructed in 1950-51, extending eleven kilometers out into Tarut Bay. The port was connected to the mainland by the railway linking the Eastern Province with Riyadh, (the capital of Saudi Arabia).

Dammam became the main gulf port and railway terminus, and owing to its rapid expansion, it became the most important city in the Eastern Province. In recognition of the pace of progress, Dammam was made the provincial capital in 1953, and the various provincial government offices were moved there from Hofuf.

The initial growth of Dammam was relatively simple, particularly during the period from 1934-50. As the people moved in they took over any empty land available and erected basic shelters surrounded with fences of locally available material. In the centre of Dammam these were separated from each other by narrow irregular footpaths,[6] because the newcomers built closely in or adjacent to the old village area; but there was very little extension outside the old residential area.

About 1947, Dammam occupied less than 170 acres, but by the 1950's the built-up area extended to 525 acres, with a very different appearance.

The new growth of Dammam had, by 1954, already been completed, with a water well and water distribution system. Many streets were given footpaths and were surfaced for traffic, and a sewer gathering system was partially installed.

The first extension close to and surrounding the old Dammam area was in area A. The second extension was in area B to the west, in area C to the near-south, and in area D to the east. The third extension was in area E to the south of a point which the Aramco Company had developed; there was also growth in area F to the south-east, which was occupied by the railway and railway residences and the railway establishment development.

In 1951 the company instituted a home ownership programme. The distinctive feature of the Aramco plan was its reliance on the development of natural communities. With government co-operation, the company began to encourage employees to build or purchase homes in existing communities[7] rather than build, operate and maintain a separate living area for its Saudi-Arabian employees away from the general population (See Fig. 8.41, photo 1956).

During 1956 and 1957 the new urban centre of Dammam continued to grow at a faster rate than before, so that the new port was larger than the original town. Soon, two difficult problems faced the newcomers and employees who wished to build their own houses; namely limited availability of property and the high cost of land. To help overcome these problems and aid these employees, the Saudi Arabian government materially assisted this effort by granting Aramco employees free lots in these sub-divisions. By 1959 the residential site which had been developed by the company was enlarged by 25%, a second well was drilled to ensure sufficient water supplies, and a private power company had extended electricity to all completed houses.[8]

FIG. 8.41. DAMMAM IN 1956.

By the end of 1960, Dammam became a principal town, not only in the Eastern Province but in the whole of Saudi Arabia, resembling Jeddah City in the Western Province. The chief port in the west was Jeddah and the chief port in the east was Dammam, thus giving Dammam a place in the national economic field, in sea and land transportation, warehousing, wholesale trade and business.

In 1960 the city area of Dammam encompassed approximately 3,600 acres, of which some 400 were built-up and 1200 were occupied by the railway yard and date gardens.[9] (See fig. 8.42, photo 1962). In 1970 the area increased to 3,685 acres (see fig. 8.43, photo 1970 and also photo 1973, fig. 8.44).

The Development of Planning

The increased oil production had increased the importance of the region and caused the government to give more attention to the development of Dammam and Al-Khobar. The development was in two stages:

(a) the establishment of a municipality of Al-Khobar with its branches of Dammam and Dhahran in 1942 gave the cities more incentive to develop, but in those early days the possibilities were not sufficient to justify plans for community development.[10] By 1947 the government and the Governor of the Eastern Province considered that as the need increased, there was a place for more experts to control the layout of the developing communities in the Eastern Province.[11] The Governor requested assistance along these lines from the oil company, who agreed to help, and the oil company surveyors began to prepare land sub-division plans, and stake out the streets and blocks on the ground.

In the following years the company gave technical advice to the local municipalities, mainly Dammam and Al-Khobar. In 1954 the company presented the results of their preliminary engineering investigation for a sewer system in Dammam, and a completed report on water resources -

FIG.8.42. DAMMAM IN 1962.

FIG.8.43. DAMMAM IN 1970.

FIG. 8.44. DAMMAM IN 1973.

which was useful to the city in planning their water distribution system.[12] In Dammam they prepared a land sub-division scheme and the blocks which were outside old Dammam were sold cheaply by the municipality to encourage people to build in the newly planned areas.

(b) The oil company saw its employees facing difficulties in their life near the oil fields. They lived as bachelors because they could not bring their families to live with them in company quarters which were far from the local communities. The company, after giving consideration to these matters, began to encourage their employees to build or purchase homes in existing communities.

Government Aided City Development

At the same time as the growth of the residential area developed by the Aramco Company, there were other private residential areas in other parts of Dammam which had been developed by the Saudi Arabian government for the general public. There was also one special area to the east which was developed by the railway organisation in Area F for its own employees. This residential site, consisting of thirty-four villas, thirty-eight bachelor housing units, a restaurant and a supermarket is to be expanded in the future, giving a further 214 houses.

The Saudi Arabian government, in an attempt to encourage people to build and live in their own houses, distributed free lots to anyone requesting a site on which to build their own home - this could be built anywhere, whether city or village, merely by gaining planning permission for the proposed area. This permission was to be granted by the Governor of the Province, who would receive an order from the Ministry of the Interior to grant such permission, and he would then transfer that order to the Municipal Authority to allocate a free lot in an area which was ready for building on. Such land grants were distributed as the result of petitions to or through the King and the Crown Prince without any formal administrative procedure. From report (since records are not

available) there would not appear to have been any planning policy built into this procedure except that government employees tended to be favoured.

On the other hand the Municipality could obtain permission from the government to take over and plan block development of land not already in private ownership. Such land was then laid out in building plots with service road alignments, these plots being categorised in three subdivisons, the first having main service road frontage, the second lying behind the first and the third being most distant from the major roads. Plots were differentially priced as follows:

Category 1 10 SR (approximately £1.20) per sq. metre.

Category 2 6 SR per sq. metre.

Category 3 3 SR " " "

This price differential is not reflected in any difference in housing type. The plots were sold outright, first come first served, over a period and the type of construction varied entirely with the purchaser's taste and wealth. In many cases therefore the purchaser of land on a main road frontage either did not want or could not afford as large or expensive a dwelling as a later purchaser of Category 2 or Category 3 land plots.

Approximately from 1974 onward neither of these procedures, although legally in force, can effectively operate since there is now no land not in private ownership for tens of kilometres distance from urban peripheries.

Home Ownership Programme

By mid-1951, the oil company had initiated a plan to make it possible for eligible Saudi Arabian employees to become the owners of comfortable homes, suitable for themselves and their families. This was achieved by advancing them an interest free loan, up to the amount that the average employee could reasonably be expected to

accumulate by regular savings, over a period of approximately 15 years.[13]

The employees eligible for this programme could choose the area of any community they liked near their field (from the town of Al-Jubail in the north to Al-Hofuf in the south), on which to build their home. They could either:

(a) employ their own contractor, and build their own house to their own design and specifications;

(b) utilise the company's technical assistance; or

(c) purchase a ready-made home in which to live.

As a result of this scheme, about one-third of all employees obtaining home loans in 1951 chose building sites in Dammam.

Development of Aramco Employees' Residential Site in Dammam

The development of the Aramco Employees' residential town site was under the control and planning of the company's engineering surveyors, who undertook the marketing of blocks, lots and streets. Plans were made in the town site of the selected location for mosques and schools, run by government agencies (See Fig. 8.45, plate 1967). The sewage and water facilities were planned by the oil company and the power facilities for houses and for street lighting were undertaken by the local electricity authority of Dammam.

(a) The Houses

In the town site itself, there were three different types of house design:

(a) Houses built by Aramco and sold to their employees

(b) Houses built by the employees themselves, under Aramco technical assistance and supervision; these were very similar to the houses originally designed by Aramco.

(c) Houses where the employees chose their own design and employed their own contractor; on the whole these were totally different from all other types of houses.

FIG.8.45. THE OIL EMPLOYEES' SITE IN DAMMAM IN 1967.

The Aramco houses were built to five different floor plans, with concrete block walls. Each house had two or three bedrooms, and was equipped with water and sewage systems, and wired for electricity.[14] The other houses were built with different floor plans, with both plan and design selected by the employees themselves. All the houses in this town site were of modern design and built in one or two storeys, as bungalows or villas, in cement and blocks and painted in different colour schemes, mostly bright colours such as brown or yellow. The room sizes varied between three and five square metres for the sitting rooms; four to three square metres for the bedrooms and dining rooms; and two to three square metres for kitchens. The one-storey houses usually had one bathroom with WC, and one separate WC, and the two-storey houses had two bathrooms and one separate WC.

The Streets

Of modern design, straight and wide, and running at right angles to each other, the streets had lighting, paved roads for cars and footpaths with a green belt in the centre. Major roads were mainly two-way streets.

The New Plan

In 1952, the population of Dammam had increased more than in any preceding year, and that same year the oil company engaged planning engineers to prepare plans for the expansion of the town for the oil communities, and their services were also made available to local government agencies.

The controlled development had first prepared land sub-division plans and staked out about 400 acres of ground in streets and blocks. The plan provided for new streets and blocks around the existing core, but these had no relation to this core. The blocks were 'oversize', measuring 300 ft by 600 ft, with 70-100ft. wide streets in between.[15]

Twenty-one blocks of a large area were being developed for the housing of the Saudi Arabian families under the new Municipal programme. About eighty-five Saudi Arabian employees asked the company for land on the site and lots were prepared for them. Early in 1955 plans were developed to begin construction on the houses.

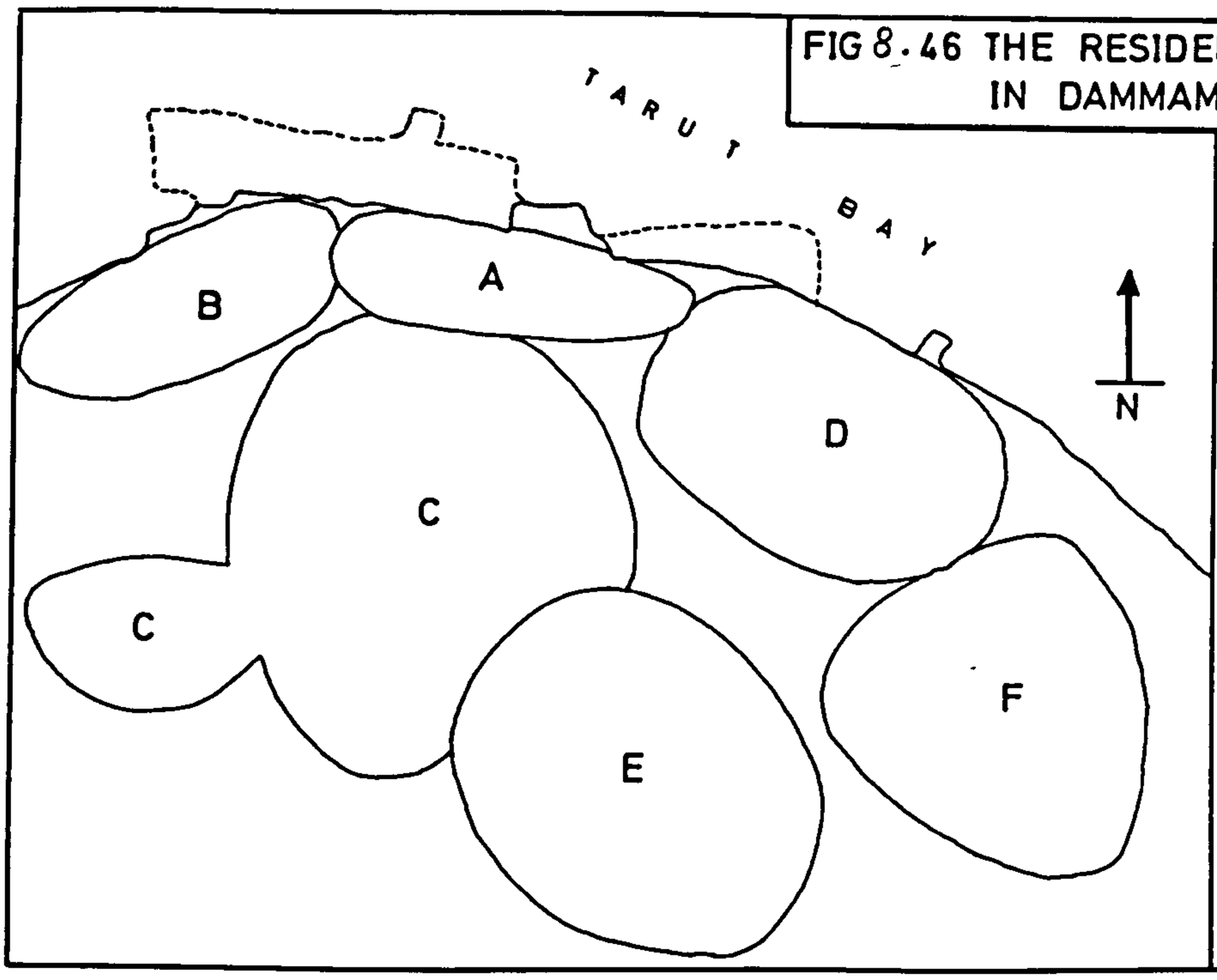
Under the ownership programme, in July 1955, the company had begun the construction of about 200 family housing units on the site allocated to their employees, and continued to develop a further 600 lots in the same year. All these lots were for employees other than those who had expressed a desire to build their own houses on land of their own choice.[16]

In 1956, the company had completed 203 houses for sale, and 579 lots; in the same year, the Municipality of Dammam had constructed and paved the main thoroughfares, the plans were completed for modern street lighting. In 1957 the Dammam Power Company installed a distribution system in the employees' town site. In 1959, the number of houses for company employees at the Dammam town site was 450, and these were owned by the employees themselves, with the aid of the company.[17]

Planned Areas of Residential Expansion (Fig. 8.46)

The greatest expansion of the residential areas is to the west, parallel with the shore at Area B. These areas have a medium density population. To the south-west, near the Central General Hospital, at the side of Area C, are the population zones with the lowest density, and between these zones lies a quiet open space, forming a gap between the main residential zones of Area C (which has a high housing density) and Area E (the employees' site). The eastern side of Dammam, at Area D, has two degrees of housing density as measured from air photographs - medium in the north of the area, and very low in the south. The surrounding medium and low density areas have already been planned for future expansion, in particular an expansion in the near future. The Town

FIG 8.46 THE RESIDENTIAL EXPANSION IN DAMMAM 1935 - 1970.



A OLD AND THE FIRST EXTENSION.

B FIRST AND THE SECOND EXT.

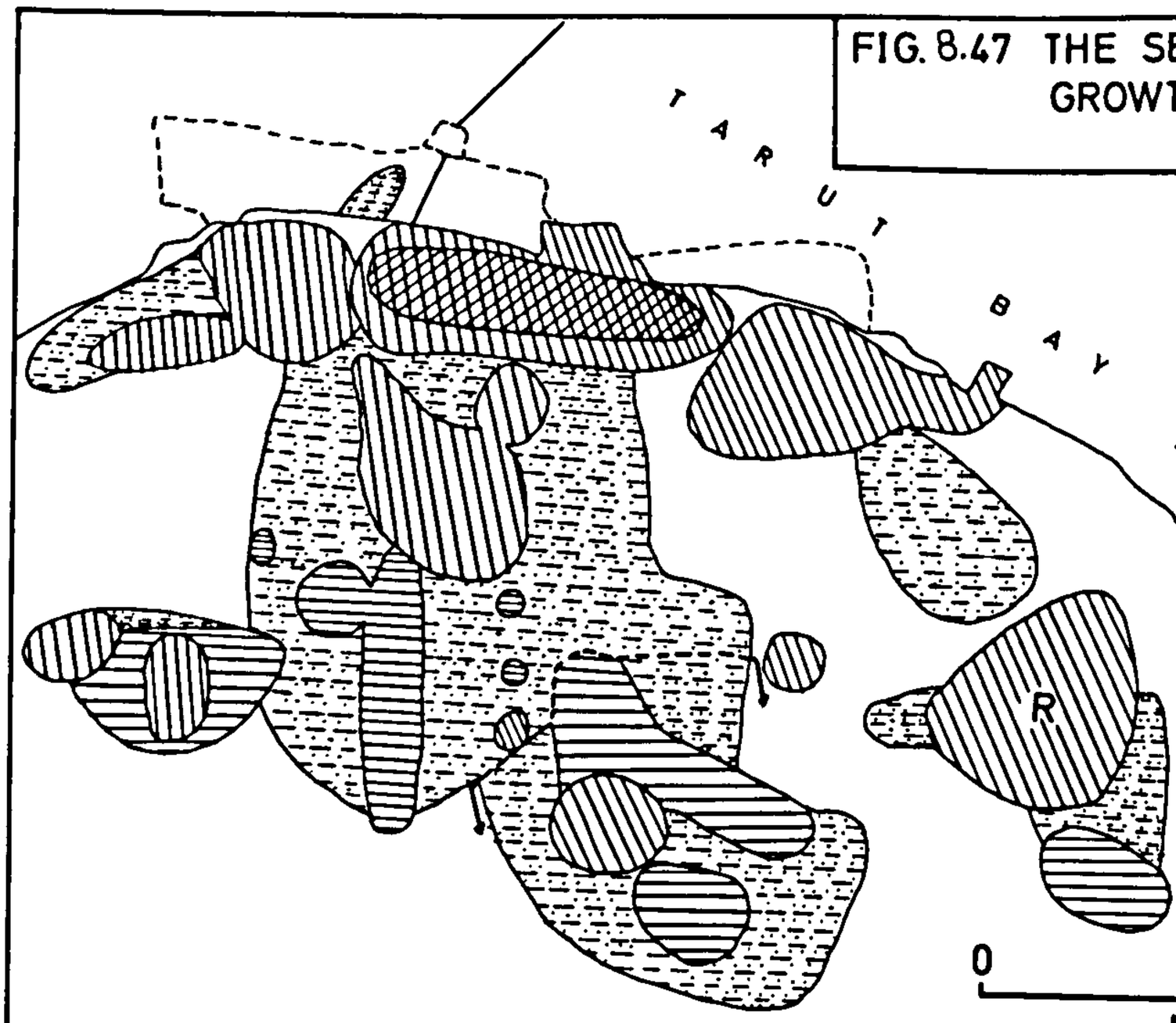
C FIRST, SECOND AND THE THIRD EXT.

D FIRST AND THE THIRD EXT.

E ARAMCO EMPLOYEES SITE IN A FIRST, SECOND AND THIRD EXT.

F RAILWAY AND INDUSTRIAL ZONE LATER FUNCTION EXT. OF DAMMAM.

FIG. 8.47 THE SEQUENCE OF THE GROWTH IN DAMMAM 1935 - 1970.



OLD DAMMAM.

1935 - 1956.

1956 - 1962

1962 - 1970.

UN USED AND GREEN AREA.

ARAMCO EMPLOYEES SITE.

R RAILWAY SITE.

0 1000 2000

metres

Planning Office of the Eastern Province (formerly in Riyadh and now in Dammam) is trying, along with the Municipality of Dammam, to give guidance to the construction and expansion. Plans have already been made for an expansion to the south-west, of more than two kilometres, and to the south an expansion of one-half to one kilometre is planned, under the control of the City Development Programme. / No further residential areas are planned to the east and south-east, as the development planning programme of Dammam suggested the setting up of industrial and commercial zones in this area for ease of access to the railroad and Dammam port. If we take a look at the final city map of Dammam as a whole, from the west to east, to the port of Dammam side, we shall see that all the residential zones have been situated on the western side, and the industrial and commercial zones have been situated on the eastern side, near the railway facilities.

The city map of 1970 gives a more complete picture of the shape of the city, by joining together the residential zones. than could the earlier maps of 1962 and 1956, and there were few open spaces in the middle of this city map. Two blocks were quite empty of building and of about sixteen blocks each was only partly built-up; these blocks were situated between the old Dammam in the north and the employees' site in the south, parallel to the road to Dhahran and Al-Khobar. There were some open spaces in the west and south-west of the city map, between the residential zones, about four were empty blocks and about five were partly built-up; these were situated near the gardens in the west. There were also some blocks, one empty and about eleven partly built-up, located in the north-west of the employees' site. In addition there was also an open space between the Central General Hospital and the main residential zones to the south-west of the city. In the east and south-east, the areas there had been planned and mostly reserved for the railway, industrial and commercial users.

The shape of the city map of 1962 indicated that the residential

zones were not completely joined together, and were scattered in four groups, the first of which was the main group - old Dammam, surrounded by new expansion. Secondly came a central area, joined to the first group by three built-up areas of residential zones. The third group is the employees' site, almost completely separated and with no residential zone joining it to the main residential zones at old Dammam. The fourth and last group comprises scattered residential zones in the east, near the shore.

The areas between these above-mentioned groups have already been planned. In the city map of 1962 three green belts were indicated. The first, on the western side was a very large garden area, which was also included in the city map of 1970. New planned partly for the residential area, the second garden was the smallest, situated in the centre of the map; this garden remained the same in 1970. The third, medium-sized garden has been demolished and was not included in the map of 1970. This area is now planned and partly built-up.

The city map of 1956 was very different in appearance from that of 1970, and consisted of four groups of residential zones of a smaller size than those same groups of 1962. They were as follows: the first group was old Dammam. Second came a group in the centre, joined to old Dammam by two blocks of residential zones, and third was situated on the eastern side, near the shore, with many open spaces separating them. The fourth and final group was the smallest and situated at the employees' site far away from old Dammam, over one kilometre.

The three gardens in the city map of 1956 were still the same size as those of 1962, although in the west one had been demolished and reduced in size by 1970. This garden could be even smaller in the future, as more of its area may be planned for more residential zones because of the increasing demand for growth; even so the gardens have not been giving their owners a satisfactory profit, and it is likely that they will be built-up or offered for sale.

The Sequence of Growth (Fig. 8.47)

The growth sequence of the city map of Dammam was very slow from 1920 to 1947, when it grew from nothing to a small fishing village (See Fig. 8.48, map 1935). This small village then became the kernel of a city and began to grow following the first planning by Aramco Company surveyors in 1947. The initial growth was close to the old dwellings of the village at Area A and was fairly rapid. Soon, Area A had expanded in the surrounding area with a few groups of houses at Areas B, C and D, including a small group of houses at Area E (the employees' site) which had begun to grow separately in 1956, during which time the railway facilities railroad and railway residential site had been built-up (See Fig. 8.49, map 1956).

In 1959 the Saudi Arabian government saw the need to plan the old and new towns and cities, and in connection with this, the United Nations sent a team of three town planning experts. Within five years two well-equipped offices were established, one in Jeddah and the other in Riyadh, with about 110 technicians engaged in the development and preparation of master plans for 42 towns and cities.[18]

The Town Planning Office in Riyadh was the principal office for all the planning in the eastern province, from the date of its establishment to the end of 1971, and then at the beginning of 1972 the Eastern Province acquired its own Town Planning Office, situated at Al-Khobar.

Areas C, E and F had expanded during the six years from 1956 to 1962 and the expansion in Area C was about twice as great as the expansion of 1956 (See Fig. 8.50, map 1962). In Area E the rate was about three times greater than that of 1956, and there was also a little expansion in Area F. The revolution of expansion in construction was from 1962 to 1970, and during these eight years all the areas have been joined together and have become almost one block, except for Area F - the railway site - which is still separately situated. All areas have

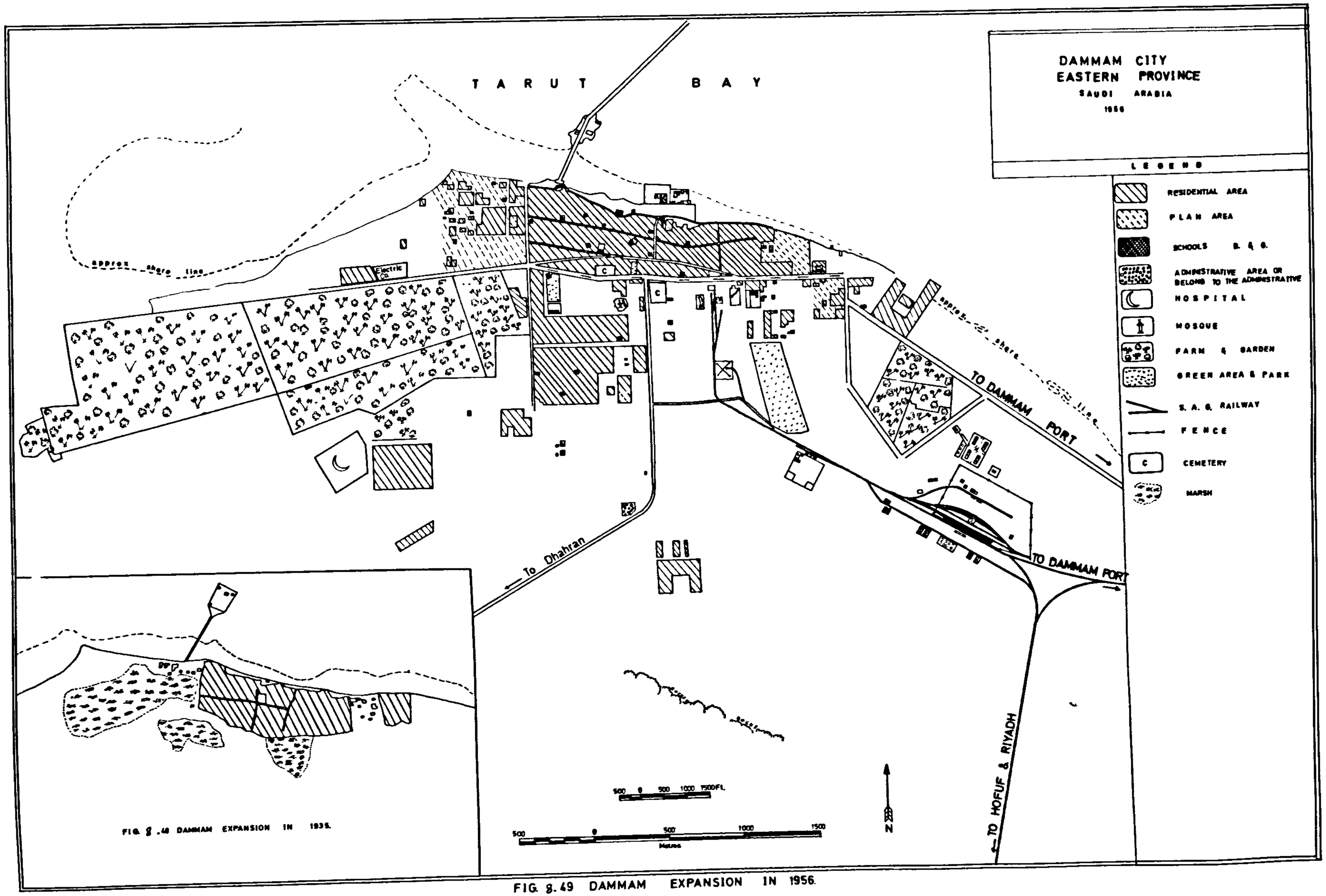


FIG. 8.48 DAMMAM EXPANSION IN 1935.

FIG. 8.49 DAMMAM EXPANSION IN 1956.

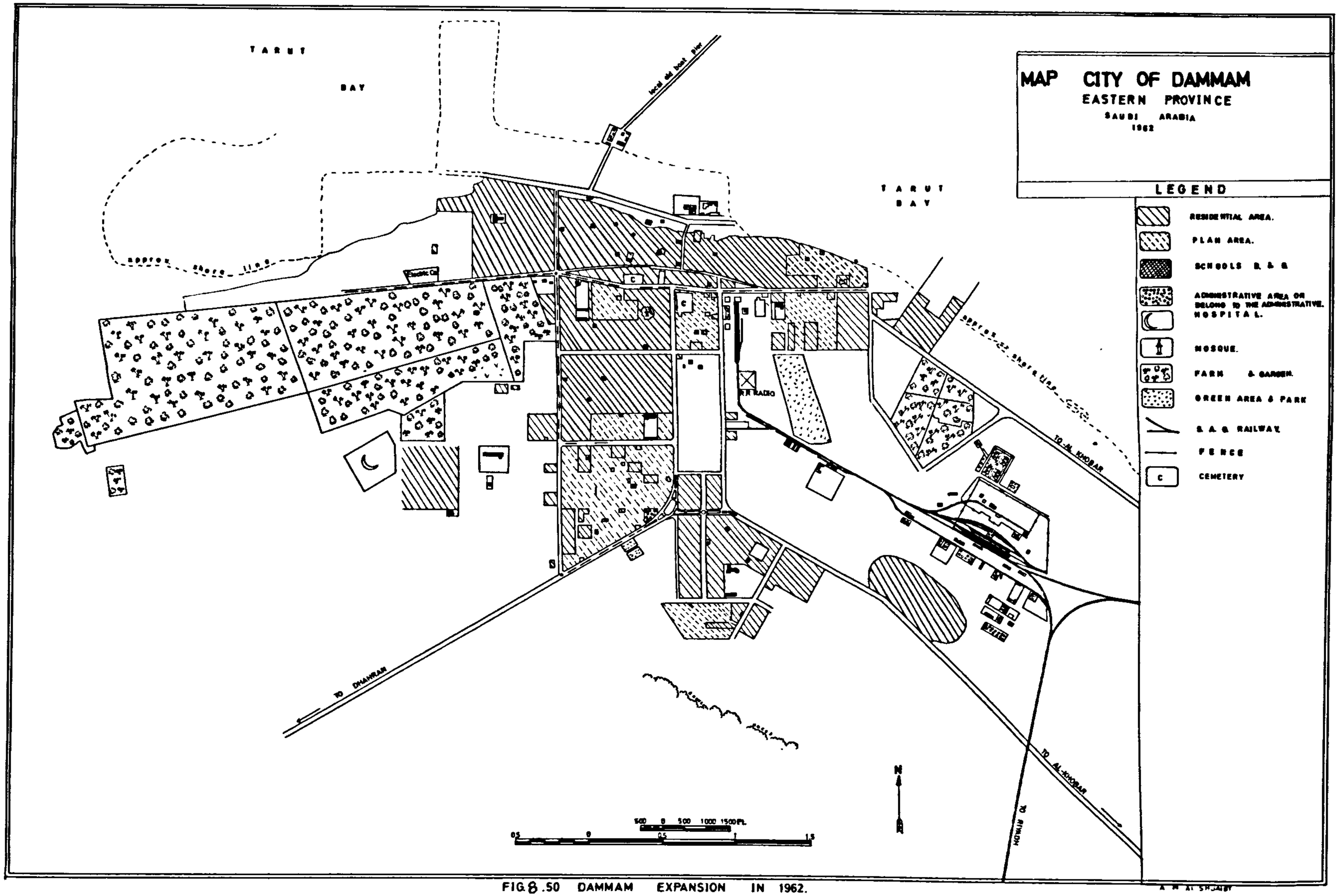


FIG. 8.50 DAMMAM EXPANSION IN 1962.

been expanded but more so Area C, at the present time, has been joined with Area E - the employees' site and Area A, the Centre of Dammam (See Fig. 8.51, map 1970). Dammam at the present time is going to expand more to the south-west and south and the areas there have already been planned, giving more residential zones together with various public utilities.

Housing

The old settlement of Dammam, originally built by the Dawasir people, and for a few hundred metres inland, has some of the original old dwellings, and others in this locality have been rebuilt with modern materials in a style similar to the recently constructed homes in the area. The old traditional houses were almost invariably one-storey buildings of mud and stones cut from the sea, and with a palm leaf root. Traditional windows had shutters but no glass, and the window at the front of the house was made from wood, and extended the length of the front wall. This style of window was very popular in Dammam and Al-Khobar, as more cool air could circulate around the house in the hot season, but these windows have been replaced in the modern design of the new houses by wide balconies. Most of the inhabitants of this older part of Dammam at the present time are lower class (uommal*) from Yemen, together with other lower income groups who live in the old mud or stone houses in the main shopping centre of old Dammam, probably because the rent of these houses is much lower (SR 3000 p.a. for three small unfurnished rooms) than that of the modern houses now being built in the new residential areas (over SR. 10000 p.a.).

Modern housing is found in the newly developed areas further south in Al-Udama, the Aramco employees' site east and south-east of Al-Tubaishi, and other quarters in the west and south-west of Dammam, usually consisting

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* Normally employed in the construction industry

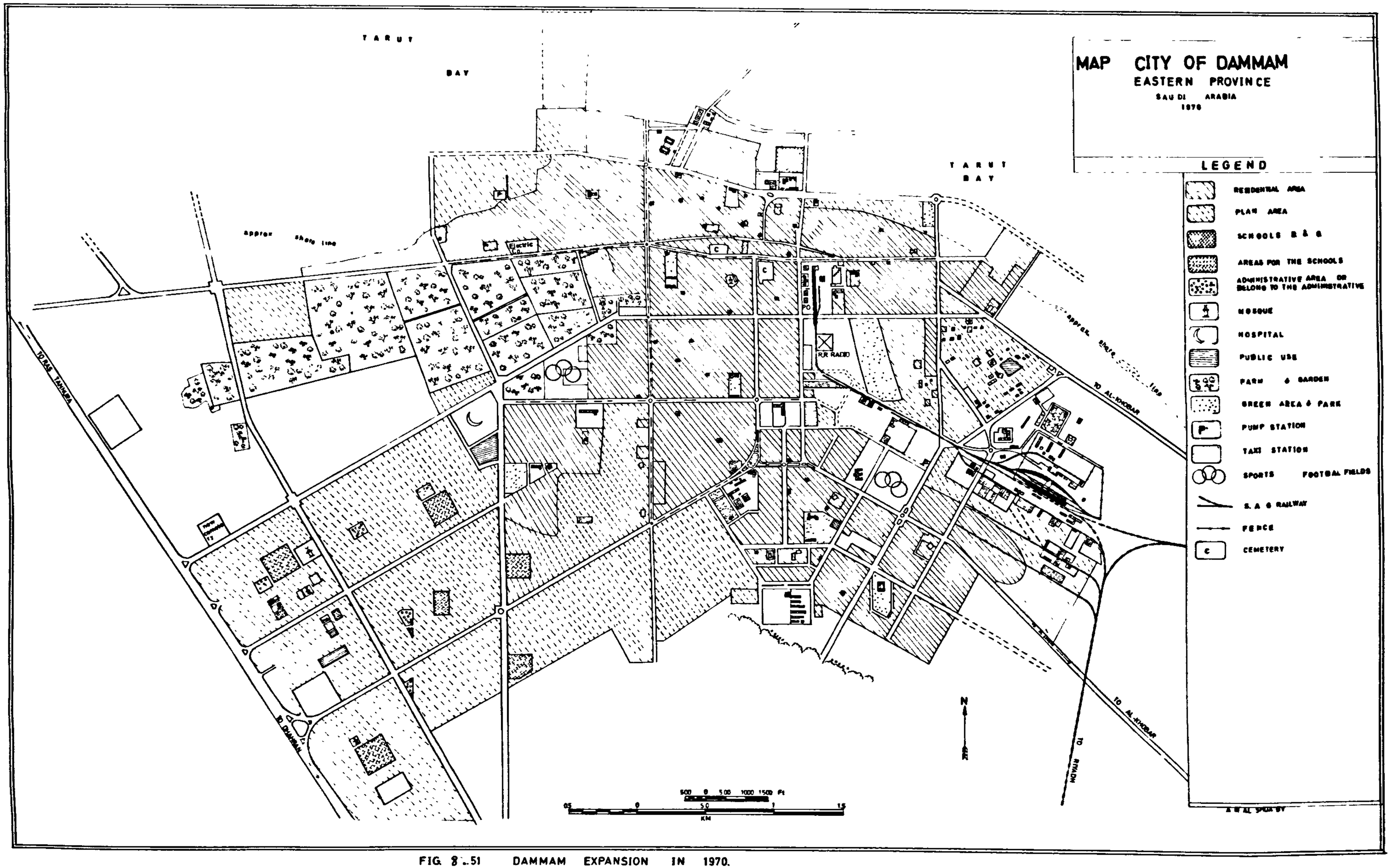


FIG. 8 ..51 DAMMAM EXPANSION IN 1970.

of modern houses and villas of not more than two or three floors, with some blocks of multi-storey flats of four to six floors. These multi-storey flats are usually occupied by newcomers working in Dammam, and are also used by companies' employees as Saudi families prefer to live in separate houses or villas. The ground floors of the multi-storey buildings, particularly those in the centre of Dammam, are normally used as shops or warehouses (See Fig. 8.52).

Modern houses and other buildings are usually constructed from cement, concrete blocks or bricks (See Table 8.35); doors and windows are made from aluminium and wood and, as has previously been explained are very different in style from the traditional large windows in older houses, since their function after the widespread use of air conditioning and fans, is to provide light rather than ventilation.

TABLE 8.35
TYPE OF BUILDING MATERIALS USED IN DAMMAM (1972)

Materials	Construction	Alteration	Compounds	Total
Cement	334	21	5	360
Stones	-	-	-	-
Mud	-	53	-	53
Block and Bricks	197	59	52	308
Others	1	44	7	52
TOTALS	532	177	64	773

Source: Ministry of Finance, Central Department of Statistics

Streets

Streets in the new built-up areas of Dammam are generally straight, and converge at right-angles due to the city being planned in a grid-iron shape. Streets in the old part of Dammam are very different, and form a haphazard maze of narrow zig-zag streets, with the exception of the main streets which were widened during the recent development of old Dammam. Many streets, especially the divided artery streets in the new areas connect with major inter-urban roads to Al-Khobar and Dhahran. The undivided streets vary in width from 3-6 metres, with some as wide as 10 metres; the divided artery streets are often as wide as 20 metres. The

New Dammam.

Old Dammam.

Clock Square.

Main street at Oil Employees' site.

FIG.8.52. OLD AND NEW HOUSES & STREETS IN DAMMAM.

main streets of Dammam are normally asphalted and provided with concrete footpaths and street lighting (See streets, Chapter 8, Introduction).

Port of Dammam

Dammam has been important since 1950 as a seaport not only for the Eastern Province but through road and rail links for the interior of Saudi Arabia (See Chapter 7). The port links Dammam with countries overseas via the Arabian Gulf, whilst the railway provided the link between the port and Dammam and Riyadh City (the capital). This helped Dammam to increase in size and importance at a faster rate due to the ensuing economic development.

There are several sea ports in the Eastern Province, the oldest and once the main port for the region being Al-Uqair on the Gulf, about 75Km from Hofuf. The port of Al-Uqair was destroyed in 1952, and its place was taken by Dammam. In Qatif Oasis the port of Al-Qatif was used for shipping to Bahrain and other Gulf countries; these operations are now carried on from the port of Al-Khobar, and Al-Qatif is now used only as a fishing port. In the Northern area of the province, the port of Al-Jubail is used for fishing at present, but will soon be developed to cater for large ships carrying heavy cargoes. This development should be complete by 1977 or 1978.[19]

At present however the largest and most important commercial seaport in the Eastern Province is Dammam. The small fishing-boat pier of Dammam was inadequate for receiving ships, because the pier was too small and in-shore water too shallow. The fishing-boat pier was developed and extended out into the sea and became a local boat pier but the new port of Dammam was extended for 11 kilometres into the sea, along the nearest line to deep water. It consists of seven wharfs for large ships and two wharfs for the smaller ships and boats. There are also workshops for the repair of boats and barges. The port of Dammam is the largest port in the Gulf, and has developed rapidly in

several phases - 1947, 1958, 1968 and 1970. It is now divided into three working sections, namely the Northern Port, King Abdulaziz Port and the port for smaller boats and barges (See Fig. 8.53 showing the port of Dammam).

The total area being reclaimed in the harbour for use as sites for grain silos and flour milling and packing is 220,850 Sq.m.; 12 store-houses will be sited on the coastal area, 633,000 sq.m. as open storage 53,000 sq.m. for storage of machine cargoes, and six storage buildings each with an area of approximately 4,800 sq.m. All storage areas will be linked by rail.

(i) Traffic Pattern of the Port

Dammam Port is one of the largest ports in Saudi Arabia with 11.7% share of the total traffic. Jeddah on the Red Sea caters for 12.6%, Yunbo, also on the Red Sea to the north of Jeddah, takes 2.1% and the highest percentage - 41.5% - is taken by the oil terminal at Ras Tannura. The other 32.1% of the total traffic movement is shared by other ports in Saudi Arabia.

At present, the commercial ports of Jeddah, Dammam and Yunbo cater for 44.5% of the total imports to Saudi Arabia. The overall growth of Dammam as a commercial port has been striking, as in 1969 freight movement totalled 803,711 tons, as opposed to only 783,742 tons through Jeddah. During the past 10 years the amount of freight through the port of Dammam has increased from 343,485 tons in 1962 to 987,016 tons in 1972. The range of goods included cement, iron, motor vehicles, machinery, wood, foodstuffs and others (See Table 8.36) showing the variety of goods imported through Dammam port during the past 12 years).

The volume of goods exported from Dammam was very small in comparison with imports. Goods exported were mainly fertilisers (from SAFCO); fish and shrimps from the packing plant, and personal goods of

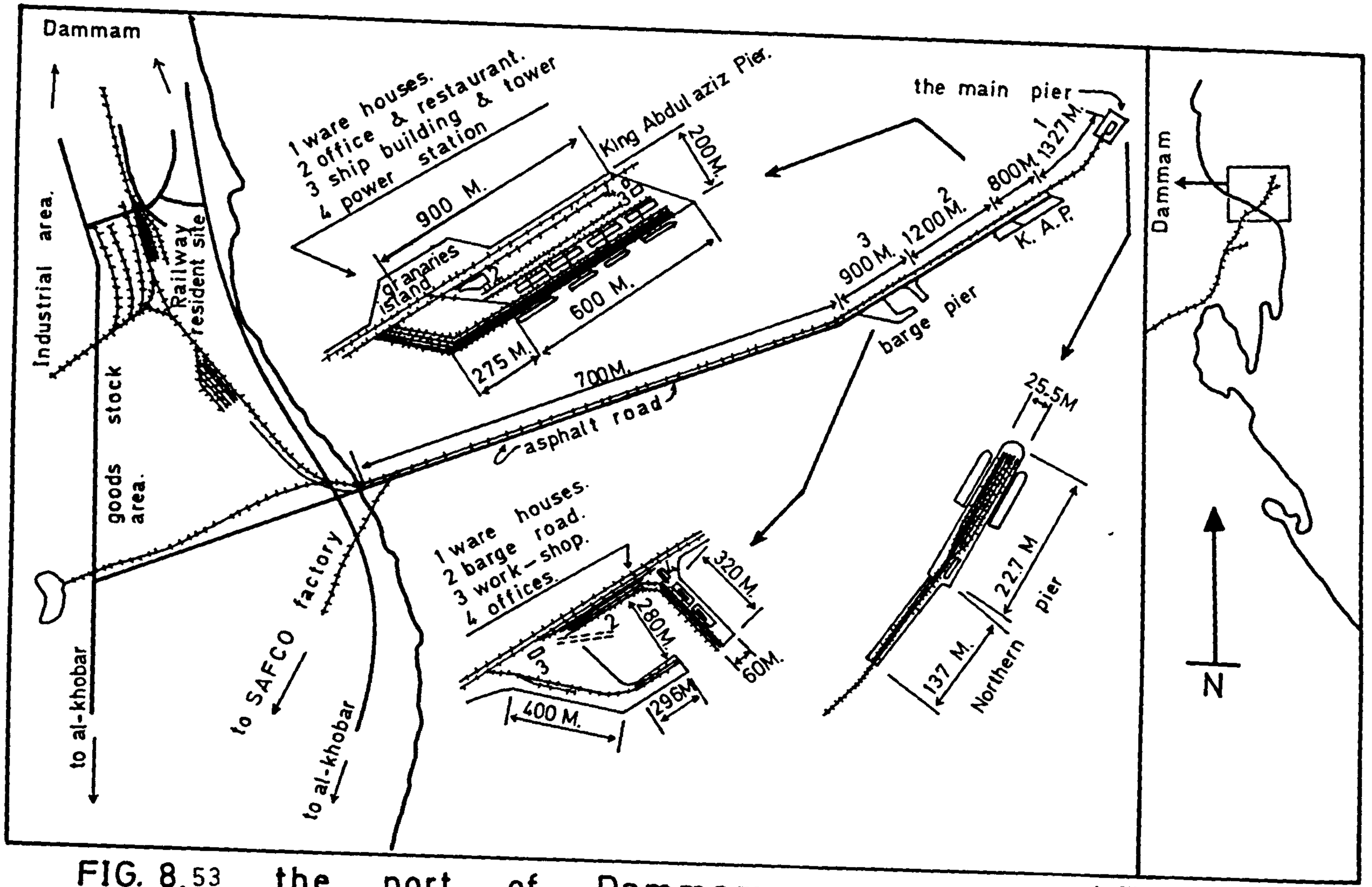


FIG. 8.53 the port of Dammam.

source;- kafilat al-zait (oil caravan)

TABLE 8.36

VARIETY OF GOODS IMPORTED THROUGH DAMMAM PORT (1961-72) - TONS

Year	Cement	Iron and Pipes	Machinery & Cars	Wood	Seeds	Flour	Rice	Coffee & Tea	Sugar	Others	Total
1961	112064	44595	3788	10323	4041	23449	29304	478	30190	110381	368613
1962	86423	43068	4668	13851	8224	27503	64540	510	203	94490	343485
1963	62512	52748	7689	20430	8289	27061	41735	686	15489	123389	360028
1964	116641	63299	9838	32553	9343	34035	34295	860	30311	146289	477464
1965	179294	171687	19727	42736	16596	46556	62577	853	27899	185181	753106
1966	154183	86123	10982	40144	8421	18610	36374	1379	28072	163415	547713
1967	37496	94215	17396	35916	29447	28859	40441	1686	5443	192000	482899
1968	143915	120519	15221	54850	11935	22893	5917	1830	23281	229566	682637
1969	270854	111758	15223	45104	11054	29127	45940	1946	3637	269068	803711
1970	127511	97637	8455	47382	29264	24797	27127	1748	20671	276117	660709
1971	193453	244301	6942	60256	31111	15997	38330	938	21695	285447	899580
1972	127555	346219	15693	46971	12724	17395	45136	2139	11721	351463	987016

Source: Railroad and Dammam Port Organisation

Aramco employees. It can be seen from the graph that the export and import figures are not balanced, and in 1962 imports were 3 times greater than exports; by 1971 the import figure was 10 times the export figure. This results in insufficient traffic travelling to and from Dammam, and in trucks travelling empty to the port to collect their loads.

(ii) Ships Calling at Dammam

Ships from all over the world call at Dammam loading goods for the commercial and industrial sectors. About 60.3% are of western European nationality, 15.1% are Asian, 6.6% are Latin American, 4.9% are eastern European, 4.0% are Arabian, 3.9% African, 3.1% US and 2.1% from other nations.[20] (See Table 8.37)

Of the western European ships, the highest proportion (21.5%) were British. Of the eastern European ships, 38.2% were from Yugoslavia; 54.7% of Asian ships were Japanese, 80.6% of Latin American ships were Panamian; 50.0% were Kuwaiti and 89.8% of the African ships carried the Liberian flag. These percentages reflect the world-wide trading relations through the port of Dammam, and also indicate the size of trade carried on between these countries and the Eastern Province.

Commercial Activities

As Dammam is the administrative centre for the Eastern Province, it has become the main commercial and industrial centre by the centralisation of business firms. All types of wholesale and retail firms serving the Eastern Province are found in Dammam, which has now become the third most important regional, commercial and industrial centre in the country. The expansion of the oil industry has emphasised Dammam's significance among Eastern Province cities, and with Al-Khobar it has become increasingly important to the economy of the region. The increasing number of commercial and industrial establishments reflects the growth of Dammam particularly over the last few years (See Table 8.38)

TABLE 8.37

NUMBER OF SHIPS CALLING AT DAMMAM PORT (BY NATIONALITY)

Nationality	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
Western European	99	131	209	173	150	258	250	248	278	283	306	294	290	310	307	332	368
Eastern European	2	2	-	-	-	3	14	8	19	26	36	27	37	46	37	36	53
Asian	4	11	25	23	18	12	22	29	33	46	42	53	99	136	156	174	188
Latin American	22	18	7	9	-	7	8	14	20	31	33	34	45	44	46	55	76
USA	13	34	22	33	18	32	17	13	12	15	3	1	2	5	-	2	1
Arabian	2	9	25	4	-	3	7	9	11	9	18	16	22	27	29	38	55
African	-	6	4	6	-	13	-	5	8	24	14	11	17	42	39	32	58
Others	-	-	-	51	100	-	-	-	-	-	-	-	-	-	-	-	-
TOTALS	142	211	292	299	286	828	318	326	381	431	454	436	512	610	614	669	799;

Source: Railroad and Dammam Port Organisation

TABLE 8.38
GROWTH IN NUMBER OF ESTABLISHMENTS IN DAMMAM

	1967	1971	Rise	% Increase
Establishments	2158	3074	916	42.4
Workers	6733	10399	3666	54.4
Average number of workers per establishment	3.1	3.4	4.0	

Source: Ministry of Finance, Central Department of Statistics.

In 1971 commercial establishments in Dammam accounted for about 29.8% of the total - a much higher percentage than in Al-Khobar, and 18.1% of the total establishments in the Province.[21] Most of Dammam's businesses are retail, and there is a greater variety of foodstuffs and other goods available than in Al-Khobar.

In Dammam, business establishments were divided as follows - commercial 83.8%, industrial 15.1% and the remaining 1.1% being transport and storage businesses. (See Table 8.39)

TABLE 8.39
SIZE AND TYPE OF BUSINESSES IN DAMMAM (1971)

Type of Business	Number	%	Employees	%	Average No. of Workers / Firm
Commercial	2576	83.8	6170	59.3	2.4
Industrial	465	15.1	3142	30.2	6.8
Transport and Storage	33	1.1	1087	10.5	32.9
TOTALS	3074	100	10399	100	3.4

Source: Ministry of Finance, Central Department of Statistics

About 8.2% of all commercial establishments are small, individual private companies, owned by local people, and run as independent establishments. They are mainly retail stores or shops selling a variety of goods, along with restaurants, hotels, estate agents, construction and business services. The second category is made up of branches of larger businesses, centre in cities outside the Eastern Province such as Riyadh or Jeddah, and this section accounts for 13.5% of the total businesses in Dammam. They are wholesale, financial, insurance (mainly for ex-patriates)

some retailers and business services. The third category is main centre establishments, with branches elsewhere, and in Dammam these comprise only 5.3% of the total, compared to 8.1% in Al-Khobar[22] (See Table 8.40).

TABLE 8.40
DISTRIBUTION OF COMMERCIAL ESTABLISHMENTS IN DAMMAM (1971)

Type of Business	Number	%	Independent Establish-ments	Headquarters Establish-ments	Branch Establish-ments
Wholesale	87	3.4	35	17	35
Retail	1688	65.6	1409	78	201
Restaurants & Hotels	167	6.5	154	2	11
Commercial Firms	45	1.7	29	8	8
Financial Firms	13	0.5	2	-	11
Insurance	4	0.2	1	-	3
Estate Agents	54	2.1	33	7	14
Health Services	2	0.1	1	-	1
Construction	60	2.3	41	11	8
Services	456	17.7	387	13	56
TOTALS	2576	100	2092	136	348
Percentages	-	100	81.2	5.3	13.5

Source: Ministry of Finance, Central Department of Statistics

Classification of commercial establishments by number of employees shows that 66.1% had only one employee (compared with 49.5% in Al-Khobar); 28.1% had between two and five employees; and only 3.5% had between five and ten employees; and only a very small minority have between ten and a hundred employees (See Table 8.41).

In Dammam, as elsewhere in the Province, employees of commercial firms fall into two categories - wage paid and unpaid. In 1971 only about 63.6% of all employees were wage paid, and 36.4% unpaid, compared with 82.3% paid and 17.7%. in Al-Khobar[23] (See Table 8.42).

Industrial Activities

Although initially begun in small workshops, industries in Dammam rapidly grew into large, limited liability companies. In 1969 there were 441 industrial establishments, and by 1971 the number had risen to 465, approximately 15.1% of all establishments.

TABLE 8.41

CLASSIFICATION OF COMMERCIAL FIRMS BY NUMBER OF EMPLOYEES (1971)

Establishments	1	2-4	3-9	10-19	20-49	50-99	100+	Total
Wholesale	35	39	9	4	-	-	-	87
Retail	1307	352	21	5	3	-	-	1688
Restaurants & Hotels	69	76	22	-	-	-	-	167
Commercial Firms	8	26	3	7	1	-	-	45
Financial Firms	2	3	2	-	6	-	-	13
Insurance	3	1	-	-	-	-	-	4
Estate Agents	19	26	2	5	2	-	-	54
Health Services	1	-	1	-	-	-	-	2
Construction	25	19	1	8	2	1	4	60
Services	235	181	30	4	4	1	1	456
TOTALS	1704	723	91	33	18	2	5	2576
Percentage	66.1	28.1	3.5	1.3	0.7	0.1	0.2	100

Source: Ministry of Finance, Central Department of Statistics

TABLE 8.42

WAGE PAID AND UNPAID EMPLOYEES IN COMMERCIAL ESTABLISHMENTS IN DAMMAM (1971)

Establishment	Unpaid	Paid	Total
Wholesale	63	195	258
Retail	1510	897	2407
Restaurants & Hotels	139	255	394
Commercial Firms	52	158	210
Financial Firms	5	239	244
Insurance	-	19	19
Estate Agents	46	176	222
Health Services	1	6	7
Construction	53	1140	1193
Services	376	840	1216
TOTALS	2245	3925	6170
Percentages	36.4	63.6	100

Source: Ministry of Finance, Central Department of Statistics

Production in most companies is only small scale, but a few firms manufacture on a larger scale and export goods overseas. Clothing manufacturers made up 28.7% of the total and most were independent. Food industries occupied second place with 20.5% of the total; metal workshops were third with 17.7%, carpentry and furniture firms were fourth with 12.1% and almost all of these firms were small, independent businesses [24] (See Table 8.43)

TABLE 8.43
DISTRIBUTION OF INDUSTRIAL ESTABLISHMENTS AND TRANSPORT AND STORAGE BUSINESSES IN DAMMAM (1971)

Establishments	Number	%	Independent Establishments	Headquarters Establishments	Branch Establishments
Agriculture and Fishing	6	1.2	6	-	-
Food Industry	102	20.5	87	3	12
Clothing & Textile	143	28.7	133	2	8
Carpentry and Furniture	60	12.1	52	2	6
Paper Products and Printing	11	2.2	8	1	2
Chemical Industry	3	0.6	1	-	2
Metal Workshops	88	17.7	68	1	19
Electricity	2	0.4	-	1	1
Water Network	1	0.2	-	1	-
Other Industries	49	9.8	43	-	6
Transport & Storage	33	6.6	6	3	24
TOTALS	498	100	404	14	80

Source: Ministry of Finance, Central Department of Statistics

These figures include small firms on the Dammam industrial estate and in nearby areas.

Classification of industrial establishments by number of employees shows that 36.2% employed only one worker; 47.8% had between two and four workers; 6.4% between five and ten workers; 4.4% between ten and twenty workers, and the remainder employed between twenty and one hundred workers (See Table 8.44).

TABLE 8.44

CLASSIFICATION OF INDUSTRIAL ESTABLISHMENTS AND TRANSPORT AND STORAGE BY NUMBER OF EMPLOYEES IN DAMMAM (1971)

Establishment	1	2-4	5-9	10-19	20-49	50-99	100+	Total
Agriculture & Fishing	-	6	-	-	-	-	-	6
Food Industry	15	76	5	3	-	2	1	102
Clothing & Textiles	89	52	1	-	1	-	-	143
Carpentry and Furniture	24	28	7	1	-	-	-	60
Paper Products and Printing	3	1	1	3	1	1	1	11
Chemical Industry	-	1	-	-	1	-	1	3
Metal Workshops	31	44	6	6	1	-	-	88
Electricity	-	-	-	-	1	-	1	2
Water Network	-	-	-	1	-	-	-	1
Other Industries	9	19	11	4	5	1	-	49
Transport & Storage	9	11	1	4	4	1	3	33
TOTALS	180	238	32	22	14	5	7	498
Percentages	36.2	47.8	6.4	4.4	2.8	1.0	1.4	100

Source: Ministry of Finance, Central Department of Statistics

Industrial Employees, like those in commercial establishments, fall into two categories - paid and unpaid, and in 1971 90.8% were paid and only 9.2% unpaid [25] (See Table 8.45)

TABLE 8.45

PAID AND UNPAID WORKERS IN INDUSTRIAL ESTABLISHMENTS AND TRANSPORT AND STORAGE IN DAMMAM (1971)

Establishments	Unpaid	Paid	Total
Agriculture and Fishing	2	13	15
Food Industry	85	615	700
Clothing and Textiles	135	99	234
Carpentry and Furniture	56	105	161
Paper Production and Printing	4	314	318
Chemical Industry	-	517	517
Metal Workshops	71	227	298
Electricity	-	412	412
Water Network	-	16	16
Other Industries	32	439	471
Transport and Storage	4	1083	1087
TOTALS	389	3840	4229
Percentages	9.2	90.8	100

Source: Ministry of Finance, Central Department of Statistics

Distribution of Special Functions

As Dammam is the administrative centre of the Eastern Province, it has become the commercial, industrial and administrative centre for the region, and shares the commercial function with Al-Khobar

(a) Administration

After the discovery of oil in the Province, the city of Hofuf in Al-Hasa Oasis became established as the administrative centre of the region, but in 1953 this function was transferred to Dammam. The main government offices of the Province (about 28 offices) are situated in the main street of Dammam, with a few in King Street (Sharia Al-Uam). The office of the Governor of the Province (Al-Amara) and the Police Headquarters of the Eastern Province are located on the coast, to the north of Dammam. Private business offices are situated in the city centre, mainly in King Street and Dhahran Street. Over the past few years these functions have given Dammam greater significance, and new projects have included the industrial estate and the new housing site for the lower income populations.

(b) Shopping Centres (See Fig. 8.54 photo 1973)

Dammam is the regional shopping centre for the whole of the Province, and several specialised functional areas are found in the main streets of the city along with sub-shopping centres at the oil employees' site south of Dammam.

1. Main Shopping Centre: main shopping streets are found in both old and new Dammam, such as Faisal and Fahah Streets in the old part of Dammam; King Street (Sharia Al-Uam) between the old and new areas, Mohammad (Al-Jaima) Dhahran and Municipality Streets in the new areas, and the numbered streets (3, 4 and 5 Streets) in central Dammam. The most important shops are the retail shops and ground floor stores for cloth, clothes and shoes for men, women and children

FIG.8.54. DAMMAM SHOPPING CENTRE.(1973)

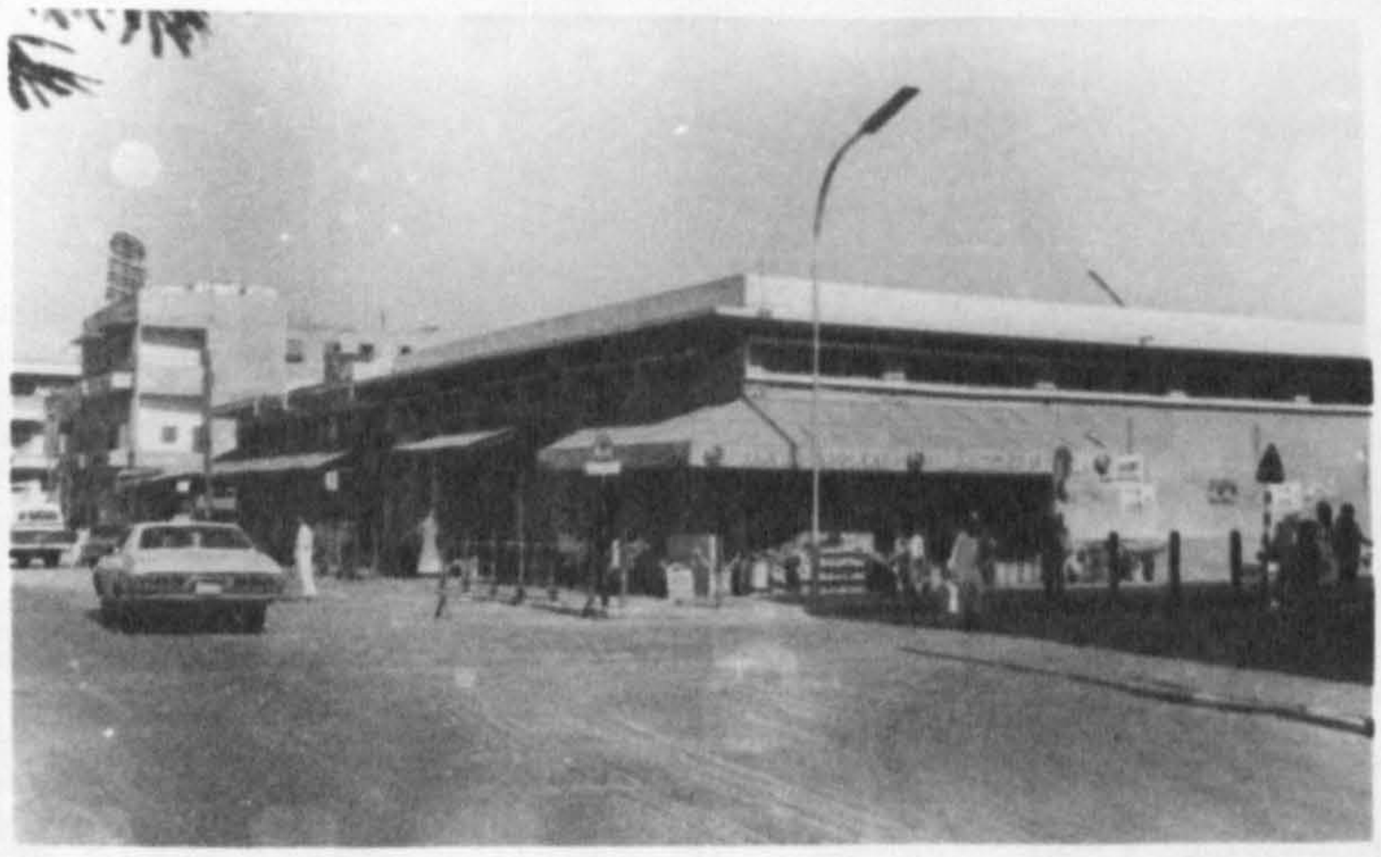
which stretch the length of Fahad Street. Cosmotics and perfumes, men's clothes, shoes, leather goods, antiques, toys and watches can be found in the covered markets in the city centre. Furniture, carpets, tailors' shops, kitchen appliances are also on sale in the covered markets; wholesale foodstores are mainly found in Faisal Street and retail food stores at Sharia Al-Jamia (Friday Mosque Street) and also in the lanes connecting King Street and Faisal Street. Hardware shops and distributors of building materials are situated in the east of Dammam, and the junctions of Faisal, Fahad and Municipality Streets. Tailors' shops, men's hairdressers, toy shops and grocery shops and motor spares distributors are mainly located in King Street. The meat, vegetable and fish markets are found in the covered market in the south of King Street and in the city centre (See plates Fig.8.55 and 8.56). Travel agents, banks and money changing offices, along with hotels and restaurants are

mainly found in King Street and Dhahran Street (See Table 8.46 and also Fig.8.57).

2. Covered Markets: there are about eleven covered markets in the shopping centres of Dammam, each with a different function, and retailing a wide variety of goods. The most important of these markets covers fourteen blocks and retails all types of goods, mainly household items including modern and traditional furniture, kitchen appliances, electrical goods, clothes for men, women and children, pharmaceuticals and luxury goods, and books. In all there are 105 shops and ground floor stores. The covered markets at Al-Rabiah and Uial Nasir are both very important markets, and the goods offered for sale include men's, women's and children's clothes, shoes, cosmetics, perfumes, watches, radios and television sets. There are about 50 shops in each of these markets.

Modern one-floor clothes store.

FIG.8.55. DAMMAM SHOPPING CENTRE.



Covered meat and vegetable market.

Foodstuffs market.

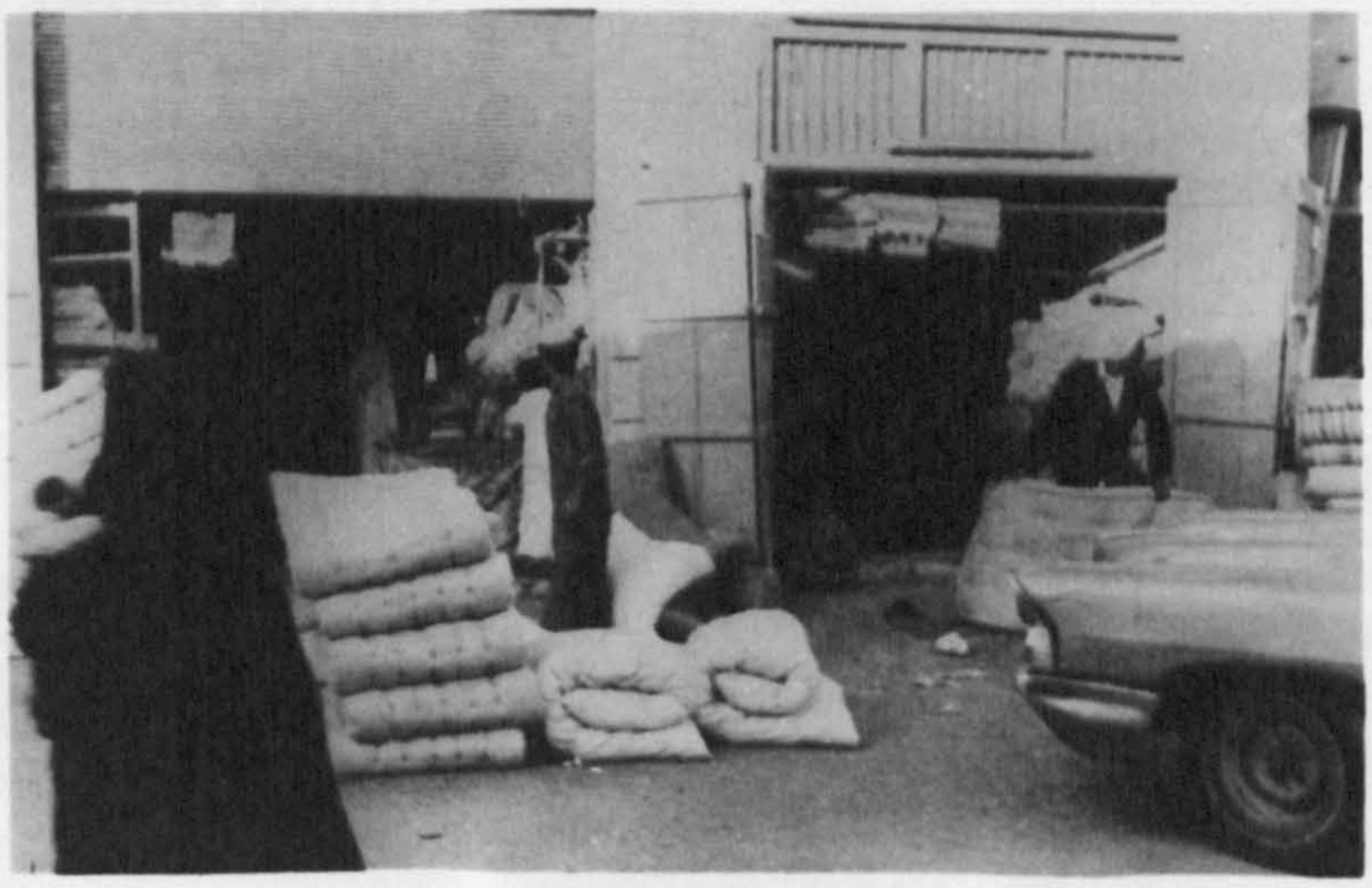
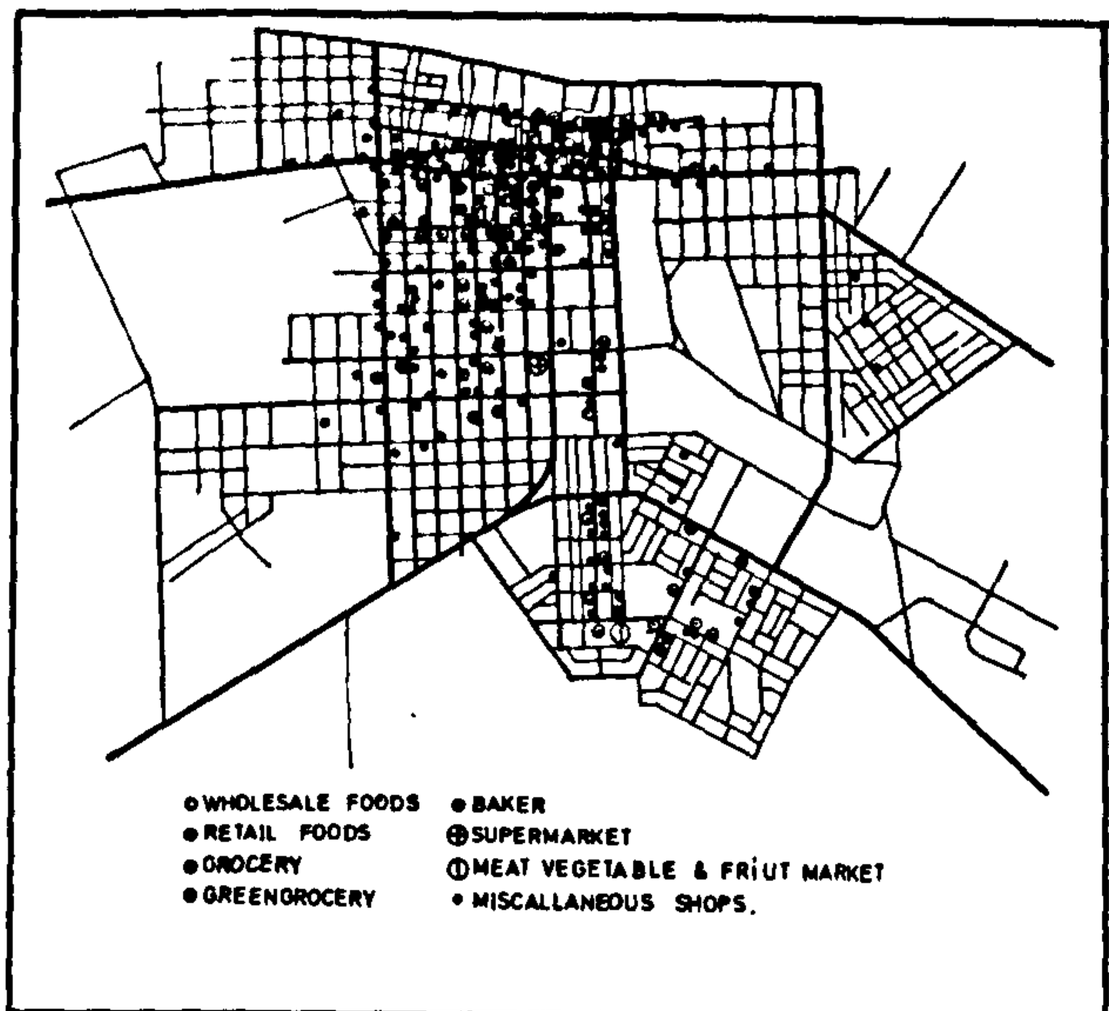
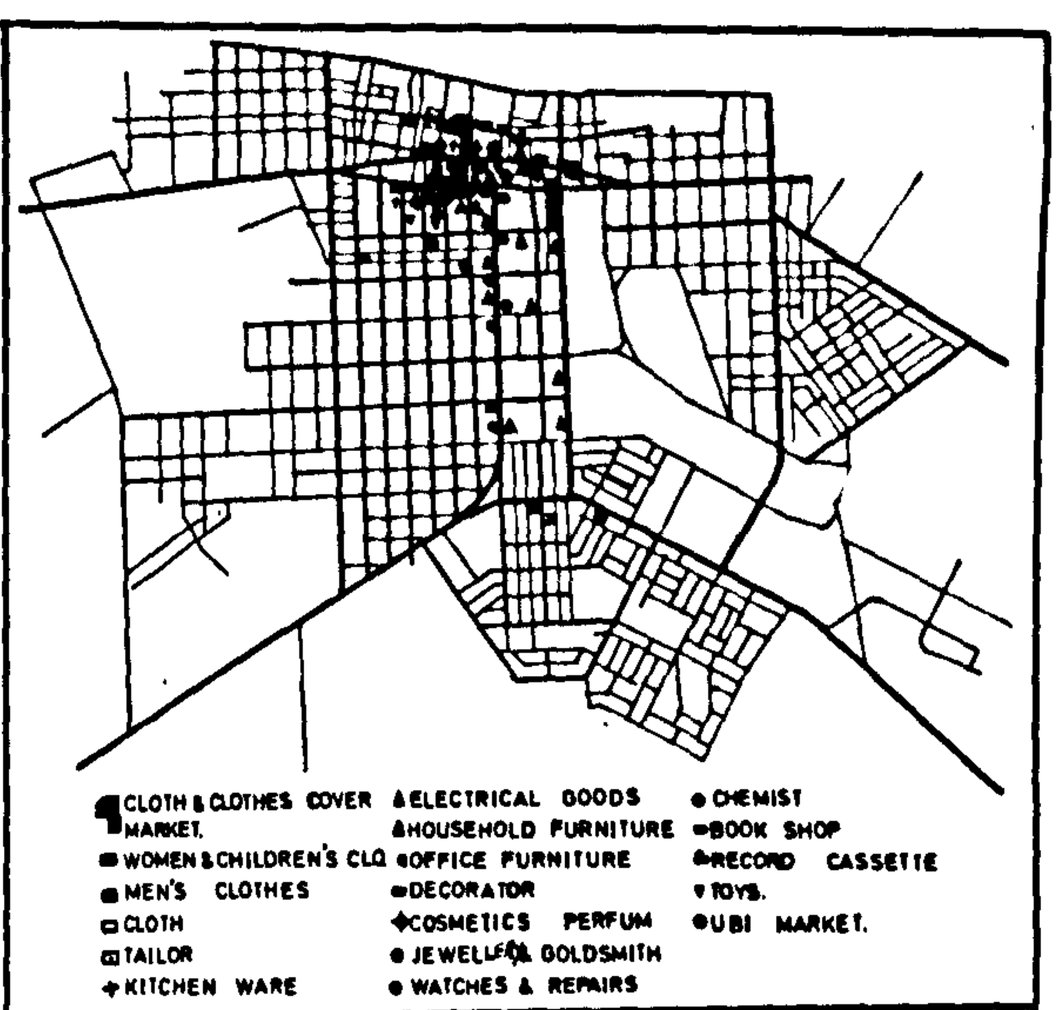
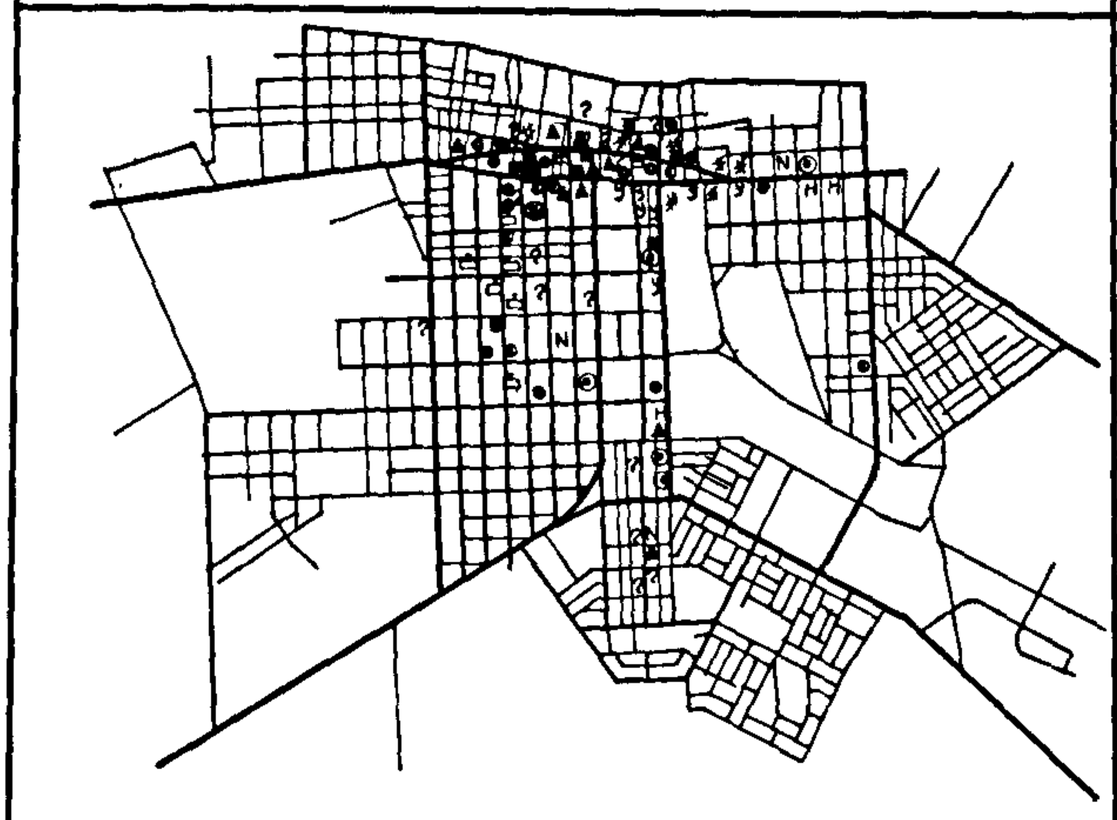
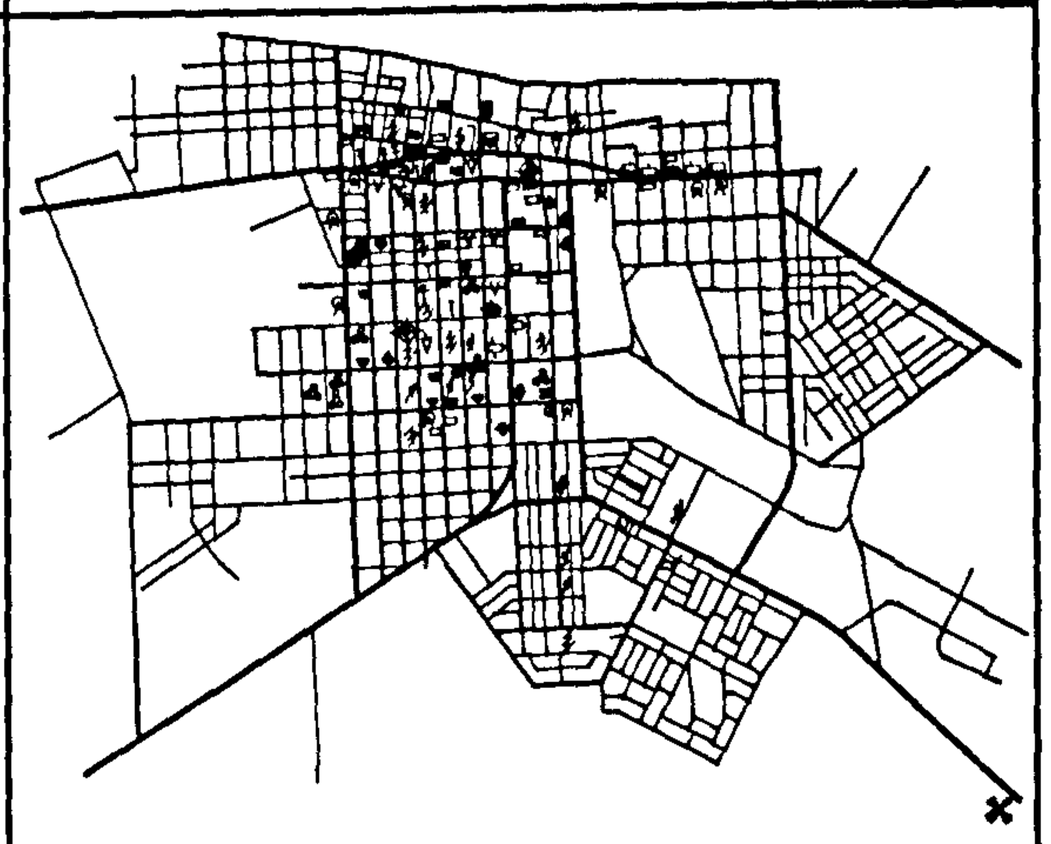


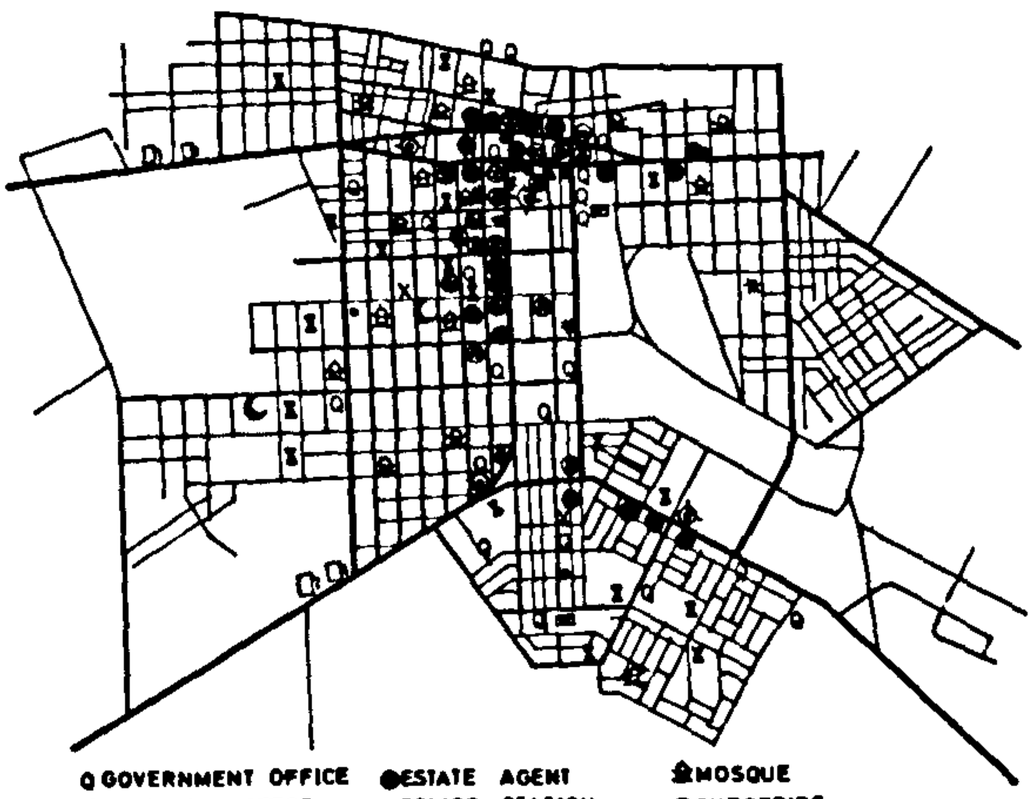
FIG.8.56. DAMMAM SHOPPING CENTRE.











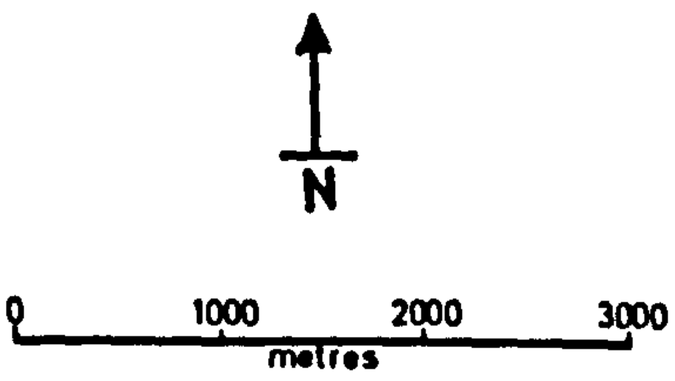


FIG 8.57 DISTRIBUTION OF SHOPS, WORKSHOPS, OFFICES, AND SOCIAL SERVICES IN DAMMAM. (1973)

TABLE 8.46

DISTRIBUTION OF BUSINESSES IN THE MAIN SHOPPING CENTRE IN DAMMAM (1973)

Group	Type of Shops	King Street	Faisal Street	Fahad Street	Mohammed Street	Street No.3	Street No.4	Street No.5	Street No.6	Dhahran Road	Municipality Street	Total
1	Wholesale Food	-	7	-	-	-	-	-	1	-	-	8
2	Retail Foods	-	3	-	-	-	18	40	-	-	-	61
3	Grocery	15	6	5	9	9	4	10	3	4	4	60
	Greengrocery	5	-	6	1	-	-	-	-	-	-	12
	Bakers	4	3	5	1	2	1	1	2	2	1	22
4	Cloth	-	-	75	-	-	-	-	-	-	-	75
	Women & Children's Clothes	-	-	110	-	1	-	-	-	-	-	111
	Men's clothes	-	8	-	-	-	-	-	-	-	-	8
	Shoes	-	1	-	-	-	-	-	-	-	-	1
	Tailors	-	16	17	5	1	1	1	-	-	-	41
5	Kitchen Ware	13	4	3	-	1	2	-	-	1	-	24
	Electrical Goods	12	10	1	2	5	12	-	6	8	6	62
	Household Furniture	8	4	-	1	-	-	-	-	2	1	16
	Office Furniture	-	-	-	1	-	-	-	1	-	1	3
	Decorators	-	-	-	2	-	-	-	-	-	1	3
6	Cosmetics & Perfune	-	-	2	-	-	-	-	-	-	-	2
	Gold Market	-	-	-	-	-	-	1	-	-	-	1
	Watches	-	3	-	-	-	-	-	-	-	-	3
	Watch Repairs	-	4	-	-	-	-	-	-	-	-	4
7	Chemists	5	-	-	-	3	-	-	-	2	-	10
	Bookshops	4	5	1	-	-	-	1	-	-	-	11
	Records & Cassettes	-	1	-	-	-	-	-	-	-	-	1
	Toys	-	4	-	-	-	1	-	-	-	-	5
8	Restaurants	14	14	5	1	5	-	-	-	4	1	44
	Fawwal Shops	-	7	4	-	-	-	-	-	-	-	11
	Coffee Shops	18	12	7	-	2	2	2	5	1	12	61
	Soft Drinks	4	-	-	-	-	1	-	-	-	-	5
9	Photographers	-	3	-	-	-	-	-	-	-	2	5
	Men's Hairdressers	1	13	11	2	1	8	2	-	2	1	41
	Launderers	-	6	11	2	6	6	1	1	2	1	36
10	Building Materials	-	35	-	-	1	-	-	-	-	7	43
	Gas Dealers	-	1	-	-	2	-	-	-	-	-	3
	Motor Spares	48	10	-	1	5	-	-	-	-	7	71
11	Warehouses	2	9	-	-	-	-	1	1	2	1	16
	Car Showrooms	-	-	1	-	-	-	-	-	-	1	2
12	Miscallaneous Shops	17	22	93	17	-	11	8	6	2	3	179

TABLE 8.46 continued

Type of Workshops	King Street	Faisal Street	Fahad Street	Mohammed Street	Street No.3	Street No.4	Street No.5	Street No.6	Dhahran Road	Municipality Street	Total
Upholsterers	-	5	1	2	-	3	2	-	-	2	15
Car Upholsterers	3	-	-	4	-	-	-	-	-	-	7
Mills	1	-	-	1	1	-	-	-	-	-	3
Carpentry	-	18	-	-	-	1	-	-	-	-	19
Joiners	-	-	-	-	1	1	1	-	-	-	3
Door & Window Frames and Glass	-	2	-	-	-	1	-	1	-	-	4
Blacksmith	2	1	-	-	-	-	-	-	-	-	3
Metal Workshops	-	2	-	-	-	-	-	1	1	-	4
Founders	-	-	-	-	1	1	3	-	-	-	5
Printers	-	-	-	-	-	-	-	-	2	-	2
TV and Radio Repairs	2	2	1	1	12	1	-	-	-	-	19
Refrigerator Repairs	-	-	2	2	1	-	-	-	-	-	5
Air Conditioning Repairs	-	-	1	-	-	-	-	-	-	-	1
Maintenance Shops	-	-	-	-	-	-	4	-	-	-	4
Furniture Repairs	-	-	-	1	-	2	-	-	-	7	10
Cycle Repairs	-	5	3	1	3	-	-	-	-	2	15
Puncture Repairs	5	-	-	5	-	1	-	-	-	1	12
Garages	27	16	-	7	1	3	-	-	-	-	54
Type of Offices											
Government	1	1	-	-	-	-	-	-	-	6	8
Business	-	4	-	-	-	-	-	-	-	-	4
Company	1	10	-	1	-	-	-	2	3	-	17
Banks	5	-	-	-	-	-	-	-	1	-	5
Money Changers	7	-	-	-	-	-	-	-	-	-	7
Travel Agents	2	1	-	1	-	-	1	-	2	-	7
Estate Agents	1	-	-	-	-	-	-	2	-	-	3
Police Station	-	1	-	-	-	1	-	-	1	1	2
Post Office	-	-	-	-	-	-	-	-	-	1	1
Type of Social Services											
Schools	-	-	-	1	-	1	-	-	-	-	2
Health Centre	-	-	-	-	1	-	-	-	-	-	1
Hotels	1	1	-	-	-	-	1	-	-	-	3
Mosques	-	1	1	1	2	2	1	-	1	1	10
Surgeries	6	-	-	-	-	1	-	-	-	-	7
Petrol Station	4	1	-	-	-	-	-	-	-	-	5
Transport Station	1	1	-	-	-	-	1	-	1	-	4
TOTALS	239	283	364	72	68	88	81	32	43	70	1341

Source: Fieldwork

The traditional markets (suqs) are Suq Al-Bahrain and Suq Al-Uobi, situated in the old part of Dammam. Suq Al-Bahrain has about 420 small shops specialising in clothes, shoes (for men, women and children) and leather goods. Suq Al-Uobi has about 20 shops which specialise in traditional garments (Uabah for women, and Mishah for men*)[27] (See Table 8.47).

TABLE 8.47

DISTRIBUTION OF COVERED MARKETS IN THE SHOPPING CENTRES OF DAMMAM (1973)

	South King Street	Between Faisal and King Street	Between Fahad & Faisal Street
Meat, vegetable & Fruit	94	-	-
Large 14-block market	105	-	-
Kuwait Market	22	-	-
Suq Al-Uobi	20	-	-
Uial Nasir	50	-	-
Al-Rabiah	-	50	-
Suq Al-Bahrain	-	420	-
New Suq for Clothes	-	-	14
Suq near Al-Qatif Taxi Station	-	20	-
Clothes Suq	-	-	15
Clothes Suq	-	-	13
TOTALS	291	490	42

Source: Fieldwork

3. Street Lanes: mainly those connecting King Street and Faisal Street, are for wholesale foodstores, tailors, grocers, TV and radio repair shops, warehouses, photographers, kitchen wares, watch repair and clothing shops etc. The other street lanes, those connecting Faisal and Fahad Streets, consist mainly of shops for kitchen wares, clothes and shoes for women and children, along with tailors and traditional upholsterers (Monajjid) etc[28]. (See Table 8.48)

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* Uabah is the traditional black cloak usually worn outdoors, and Mishlah is the traditional outdoor robe worn by men; it is normally made from a lightweight material, in brown, with a gold or white collar.

TABLE 8.48
DISTRIBUTION OF BUSINESSES IN THE STREET LANES IN THE MAIN SHOPPING CENTRE IN DAMMAM (1973)

Group No.	Type of Shops:	Between King Street and Faisal Street	Between Faisal Street and Fahad Street	Total
1	Wholesale Foodstuffs	21	-	21
2.	Retail Foodstuffs	10	-	10
3	Groceries	2	2	4
	Bakers	1	1	2
	Seed Merchants	5	-	5
	Dates	3	-	3
	Sweets	-	4	4
	Legumes	8	-	8
4	Clothes and Shoes (Men, Women & Children)	14	-	14
	Children's Clothes	-	2	2
	Shoes & Leather Goods	1	-	1
	Tailors' shops	14	7	21
5	Kitchen Ware	7	6	13
	Electrical Goods	1	1	2
	Furniture	1	-	1
	Decorators	2	-	2
6	Watch Repairs	8	-	8
7	Toys	1	-	1
	Bookshops	1	1	2
	Records	2	-	2
8	Restaurants	3	-	3
	Fawwall	1	-	1
	Coffee Shops	5	3	8
	Tobacco Dealers	1	-	1
9	Photographers	9	1	10
	Men's Hairdressers	5	-	5
	Launderers	2	-	2
10	Building Materials	1	-	1
11	Warehouses	7	-	7
12	Miscellaneous Shops	3	25	28
	Type of Workshops			
	Upholsterers	-	4	4
	Furniture Repairs	1	-	1
	Door, Window Frames and Glass	4	-	4
	TV/Radio Repairs	10	1	10
	Refrigerator Repairs	2	-	2
	Air-conditioning Repairs	1	-	1
	Sewing Machine Repairs	1	-	1
	Shoe Repairs	1	-	1
	Cooker Repairs	1	-	1
	Type of Offices			
	Business Offices	6	-	6
TOTALS		173	61	234

Source: Fieldwork, 1973

4. Sub-Shopping Centre: The sub-shopping centre is mainly patronised by the residents of the Aramco employees' site, and is located on the high street of that site, and its surrounding areas. There are about 135 shops, mainly general shops, grocery shops and a small number of other shops, along with a covered market for meat, fruit and vegetables. In the centre of this shopping area there is a Post Office, health centre, schools and offices for government and private sector business. [29] (See Table 8.49).

TABLE 8.49
DISTRIBUTION OF BUSINESSES IN THE SUB-SHOPPING CENTRE OF DAMMAM, 1973

Group No.	Type of Shops	The Main Street	Second Main Street	Al-Khobar Road	Total
3	Grocers	7	11	-	18
	Bakers	2	6	-	8
	Covered Market for Meat	1	-	-	1
4	Women's & Children's Clothes	2	1	-	3
8	Restaurants	1	-	-	1
	Fawwal	1	-	-	1
9	Men's Hairdressers	7	2	2	11
	Launderers	3	3	1	7
12	Miscellaneous Shops	27	11	5	43
	Type of Workshops				
	Upholsterers	1	-	-	1
	Founders	-	4	1	5
	Printing	-	-	1	1
	Maintenance	1	-	-	1
	TV/Radio Repairs	2	-	-	2
	Refrigerator Repairs	1	-	-	1
	Cycle Repairs	2	-	-	2
	Type of Offices				
	Government	2	4	2	8
	Company Offices	-	2	-	2
	Estate Agents	-	3	1	4
	Police Station	1	-	-	1
	Post Office	1	-	-	1
	Type of Special Services				
	Schools	2	1	2	5
	Health Centre	-	-	1	1
	Surgeries	1	1	-	2
	Mosques	2	2	-	4
	Hotels	-	-	1	1
	TOTALS	67	51	17	135

Source: Fieldwork, 1973

Public Utilities

Since 1950 when the rate of population growth increased in Dammam more facilities have been built. Projects were carried out for the provision of drinking water with storage tanks and a pumping station, and a sewage disposal network, first begun in the oil employees' site in the south of Dammam, was installed along with the Electricity Board's scheme for providing street lighting in Dammam.

1. Water; Dammam has experienced great difficulty in finding good drinking water; water was mainly obtained from shallow wells, and was usually salty. In 1960 the public utilities office in Dammam investigated the possibility of supplying piped water from deep wells, and these investigations were completed in 1966. In 1969, the government considered the water problem in terms of both quantity and quality of water, and instigated an investigation into the desalination of sea water at a desalination plant located at Al-Khobar.[30] This plant now has an estimated output of 7,500,000 gallons per day, sufficient for the needs of the five cities and towns of Dammam, Al-Khobar, Saihat, Qatif and Safwa. At the same time a new network for the distribution of water was established and many houses were connected to the new system; by 1973 the number of houses receiving piped water from this system was 8,590, or approximately 68.7% of the total.

At present, Dammam is supplied from five artesian wells, three of which are at the oil employees' site, and these three supply about 70.0% of Dammam's water requirements. The average total daily output is approximately 23,000 cmH. Water consumption in Dammam is reported to exceed the estimated consumption for urban residents of 150 litres per person per day, by a considerable margin.[31]

2. Sewage: recent improvements in Dammam have included the completion in 1973, of a modern sewage system discharging directly into the sea. Dammam has one main sewage pumping station, located to the north-west of Dammam and two sub-stations, one to the north-east and the other

to the south of Dammam.[32]

3. Electricity: the Electricity Company of Dhahran District, which is the largest electricity company in the Eastern Province, is situated in Dammam. Established in 1957 this company supplies electricity to Dammam, Al-Khobar, Qatif, Saihat and Al-Thugbah suburb. In 1973 domestic, commercial, industrial and public use consumed 16,047 units of electricity, 49.6% more than in 1967. 74.8% of the consumers were domestic, 20.6% commercial, 0.6% industrial and 3.7% were used for public utilities, which included street lighting government offices, schools, hospitals, mosques, hotels and other public buildings.[33] (See Table 8.50)

TABLE 8.50
ELECTRICITY CONSUMED IN DAMMAM, 1973

Type of Consumer	Units Consumed	Percentage of Total
Domestic	12,009	74.8
Commercial	3,301	20.6
Industrial	102	0.6
Public Utilities	594	3.7
Others	41	0.3
TOTALS	16,047	100

Source: Fieldwork 1973

Social Facilities

Schools (See Table 8.5I)

Hospitals

Dammam has two hospitals, with a total of 295 beds; the main hospital is the Central Hospital of Dammam and the other is the Chest Hospital. There are also two out-patient clinics, one in Al-Udahama Quarter and the other in the oil employees' site south of Dammam. The Blood Bank is located in the hospital and the Port Quarrantina in Dammam Port; Dammam also has a sanitary office. In 1972 Dammam had a total of 19 chemists' shops, eight of which were wholesale and the reaminder retail.[34] Most of these shops are located in the central area of Dammam; five in the Main Street (King Street), three in one of the covered markets near the main street and two in Dhahran street. Dammam also has nine

TABLE 8.51

DISTRIBUTION OF SCHOOLS AND PUPILS AND CHANGES BETWEEN 1970 and 1972 IN DAMMAM

LEVELS	SCHOOLS								PUPILS							
	1970			1972			Change		1970			1972			Change	
	B	G	T	B	G	T	No.	%	B	G	T	B	G	T	No.	%
Kindergarten	1*	4**	5	1	5	6	1+	20.0	619	284	903	797‡	487	1284	381+	42.2
Elementary	19	13	21	17	28	38	6+	18.8	6894	5908	12802	8234	7254	15488	2686+	21.0
Intermediate	5	1	6	6	3	9	3+	50.0	1275	540	1815	1677	1242	2919	1104+	60.8
Secondary	1	1	2	1	2	3	1+	50.0	653	131	784	555	296	851	67+	8.5
Teacher Training																
Intermediate	1	1	2	1	1	2	-	-	498	391	889	481	205	686	203-	22.8
Secondary	-	1	1	-	1	1	-	-	-	54	54	-	152	152	98+	181.5
Commerce & Industry																
Commerce	-	-	-	1	-	1	1+	-100	-	-	-	89	-	89	89+	100.0
Industry	1	-	1	1	-	1	-	-	153	-	153	220	-	220	67+	43.8
Evening Schools																
Elementary	-	-	-	-	1	1	1+	100	-	-	-	-	200	200	200+	100.0
Intermediate	1	-	1	1	-	1	-	-	540	-	540	420	-	420	120-	22.2
Secondary	-	-	-	1	-	1	1+	100	-	-	-	169	-	169	169	100.0
TOTALS	29	21	50	34	30	64	14	28.0	10632	7308	17940	12642	9387	22029	4412	24.6

* Boys only

** Mixed, boys and girls

‡ Boys of government and private kindergarten

Source: Ministry of Education and the Presidency of Girls Education.

private doctors' surgeries usually open from 9.00 am to 9.00 p.m.; six of these surgeries are in King Street and the others are distributed around the surrounding areas, near the centre, and at the oil employees' site.[35]

Hotels

In Dammam there are seven hotels, most of them in the centre of the city at Faisal, King and Dhahran Streets. The hotels are of varying standards, from first to third class.[36]

Banks

Dammam has seven banks, five of which are found in the main street, and the others in Dhahran Street. There are also seven money-changing shops, all in King Street.[37]

Religious Buildings

Dammam, in contrast to Al-Khobar, (which has a large population of mixed nationality non-Muslims) has very few non-Muslims in its population. Dammam is the residential area for almost all the local Saudi and Arab personnel working in the government sector, as it is the main administrative centre for the Eastern Province.

In Dammam there are approximately 58 mosques; the main mosque is in Commercial Street (Sharia Al-Jamia); about 22 of the mosques in Dammam are Friday mosques, and these are scattered through Dammam.[38]

The Sunni Muslim people throughout the area are divided into four beliefs (Mathahib), Hanbali, Shafi'ai, Maliki and Hanafi. However in the Eastern Province there is also a significant minority of Sh'ia Muslims, a very common belief in the Arabian Gulf areas and in addition in Iran and Iraq.

In my fieldwork (Summer 1973) the sample survey of the population gave a proportion in Dammam of the number of Sh'ia at 9.7% of the sample, compared with Qatif, the religious centre of Shi'ia in the Eastern Province, at 95.0% The majority of Dammam people are of the Hanbali belief, with about 33.5%, Shafi'ai with 26.1%, Maliki 16.0%, Hanafi 13.6% and Shi'iah with 9.7% of the sample. (See Table 8.52)

TABLE 8.52
RELIGION AND BELIEFS: NUMBERS OF DAMMAM (1973)

Religion & Belief	Number	Percentage
Hanbali	609	33.5
Shafi'ai	475	26.1
Maliki	290	16.0
Hanafi	247	13.6
Shi'iah	177	9.7
Unknown	20	1.1
TOTALS	1818	100

Source: Fieldwork

Transport Stations

Dammam has three taxi transport stations; the station in the east of Dammam is for passengers travelling to Riyadh; the station in the west is for passengers travelling south of the Eastern Province to Abqaiq and Hofuf; both stations are outside the city centre; the third station is for passengers travelling north to Qatif, Ras Tannura, Al-Jubail and other areas, and this situation is at King Street, in the city centre. For passengers travelling to Dhahran and Al-Khobar, there are no particular transport stations, but there are stop points at the beginning and centre of Dhahran Street, and often taxis will pick up passengers at any point in King Street and Dhahran Street. The railway station is in King Street, behind the Municipal Offices in the east of Dammam.

Parks

There are three areas set aside in Dammam for use by the general public as city parks, one in the centre of Dammam, the second to the east overlooking the sea, and the third to the south near the Aramco employees' site.[39]

Cemeteries

Dammam has three cemeteries, all situated in the city centre; two at King Street (one near the railway station and the other in the

street of the seed shops), and the third in Dhahran Street. The latest trend in the Eastern Province is for cemeteries to be located outside the city, and Dammam's new cemetery is to be outside the city 3Km south-west of Dammam.[40]

Dammam, within less than 30 years, has then grown from virtually a small traditional coastal village to an urban community with the whole range of urban functions and has become not only the chief urban centre of the Eastern Province, but also a town of national ranking. Further comment on its status and function in comparison to other settlements is made in the chapter conclusion.

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D. AL-KHOBAR

General Location and Site

Al-Khobar is situated on the sandy coastal plane of the western Arabian Gulf shore. From the latitude of Jubail southward, a wide north-south belt of drifting sand lies a few miles inland; this often piles up into large dunes which affect Al-Khobar on windy days, owing to the prevailing north and north-west sandy winds, and due to its unprotected position on the vast flat territory of the Gulf.[1]

The shore at Al-Khobar is very similar to that at Dammam, with reefs and shallow water and for this reason the short pier at Al-Khobar is only suitable for small boats.

Historical Outline

In 1921 a group of Dawasir people migrated to Al-Khobar from Bahrain, and it became established as a small fishing hamlet, consisting of a few families of pearl divers and fishermen. In 1933 the first field camp was established near Al-Khobar to search for oil, approximately 10 km north-west of Al-Khobar at Dammam Dome - Jabal Dhahran. In 1935 Al-Khobar was selected as a marine unloading site, to handle materials and supplies. Initially there was built a small pier through the shoals, into water deep enough to allow small boats and barges to dock. As the oil company could not bring their heavy equipment to Al-Khobar, they constructed this pier with whatever materials and labour they could find locally. The oil company linked this pier by a graded road to the drilling site at Dammam Dome, this becoming the first road stretching out from Al-Khobar after the difficulty of getting through the sand dune belt to the west had been overcome. After the building of the road, the government established a customs post at the new small port, and this was the beginning of a small community, where little had previously existed.

In 1938, when oil became commercially exploited, a small storage depot was built by the oil company at the shore end of the landing pier for use as a shipping terminal, and a six inch pipeline was constructed to carry oil from the field to the storage tanks to await shipping by barges to Bahrain Refinery.[3] In this small way the first exports of crude oil (approximately 12,000-15,000 barrels per day)[4] began to flow to the world markets, until in 1942 the Ras Tannura terminal pier began exporting the crude oil. The six-inch pipeline and pumps installed at Al-Khobar were later converted to carry water, but the pumps were only capable of delivering 300 gallons per minute, whilst a minimum of 400 gallons per minute was needed for the company fire engine alone.[5]

After the Second World War, the oil industry rapidly expanded in the Eastern Province and Al-Khobar port, with its shallow off-shore approaches, proved inadequate for the increasing amount of material being shipped in (e.g. heavy construction materials etc.); surveys indicated that the best location for a deep water terminal would be Dammam, and Al-Khobar lost its first modern port function.

The Population and its Growth

The original population of Al-Khobar was made up of Dawasir and numbered no more than 75 people in 1934, living in fifteen mud houses and huts, and using 2 mosques employed in pearl diving and fishing. (See Fig. 8.58 photo 1934). When the first oil camp was established in 1933 at Dhahran Dome, Al-Khobar was the nearest settlement to the camp, and some of its inhabitants opened small shops to serve the oil employees; from then onward Al-Khobar attracted merchants and traders who also set up businesses, and Al-Khobar eventually emerged as a commercial area, mainly for the employees of the oil companies. People migrated to the area from all over Saudi Arabia and other Arab countries, as well as from all over the world, seeking high-paid jobs in the oil industry.

Fig. 58. AL-KHOBAR IN 1935.

(See Chapter 4B: The Urban Sample Survey in Dammam and Al-Khobar). Soon Al-Khobar began to grow, rapidly becoming the large retail commercial centre for the newly developing areas in the Province.

The population of Al-Khobar had different levels of education and income, according to the nature of their work, and they can be divided into two groups - oil men and business people; the oil men were of many nationalities, with varying educational levels and life-styles, according to the salary and position; the business people were almost all Saudis, with a few from other Arab countries and generally of a similar educational standard and life-style.

This varied population gave Al-Khobar a community which developed from 1940 onwards to have a different system of life from the rest of the Eastern Province (See pp.103-135) During the early stages, in the 17 years from 1934-51, the growth was rapid and during this period the population increased from 75 to 13,000 inhabitants. In the years after 1951, the growth was slower and from 1951-62 the population increased to 20,000 - a growth rate of only 23.1%. A further rapid increase occurred between 1962-70, when the population rose to 38,000 - an increase of almost 90% (See Table 8.53). This period reflected the real growth compared with previous years, not only in population size but also in the economic development of the Eastern Province.

TABLE 8.53
THE GROWTH OF POPULATION IN AL-KHOBAR

Year	Population	Percentage Increase	Period
1934	75		
1951	13,000	17,233.3	1934-51
1962	20,000	23.1	1951-62
1970	38,000	90.0	1962-70

Source: Aerial photograph analysis (personal estimation).

Old and New Al-Khobar

About 40 years ago Al-Khobar consisted of a few families of pearl divers and fishermen, living in a humble fishing village which

FIG.8.59. AL-KHOBAR in 1951.

FIG. 8.60. AL-KHOBAR IN 1962.

Al-Khobar's area increased to 1224 acres, an increase of about 78.4%, including the suburb of Al-Thuqbah (See Table 8.54, also Fig.8.61, photo 1970 and Fig.8.62, photo 1973).

TABLE 8.54
SEQUENCE OF GROWTH IN AL-KHOBAR CITY AREA

Year	Acres	Increase	Percentage
1951	121		
1962	686	565	466.9
1970	1,224	538	78.4

Source: Aerial photographs (personal estimation)

In 1942 the construction of the municipality of Al-Khobar was carried out with the co-operation of the oil company. In the early days Al-Khobar had dug artesian wells for water, sewage, pumping stations and street lighting, but by the 1960s Al-Khobar had a central market, selling a variety of goods, and had paved streets. As the town was enlarged the whole length of the main street was lined with shops and the business section dominated all other streets. There were then two banks, an ice house, several garages and an electric power company, which began operations in 1951. Al-Khobar's largest department store, modern two-storey buildings complete with plate glass show windows, was built before Dammam's. A second department store opened for business early in 1951. By the 1960s the oil company's employees and their families were feeling at home in Al-Khobar, as they could now buy all their family's food and household goods, a great change since 1950 when such things would have been available no nearer than Beirut and perhaps even London.[9]

Al-Thuqbah Suburb

Established after Al-Khobar, this suburb lies about 2½ miles to the south-west of Al-Khobar. In the early days, there was a well named Al-Thuqbah, where the fishermen of Al-Khobar village obtained their water; in the early 1950s it was a small collection of Bedouin

FIG.8.61. AL-KHOBAR IN 1970.

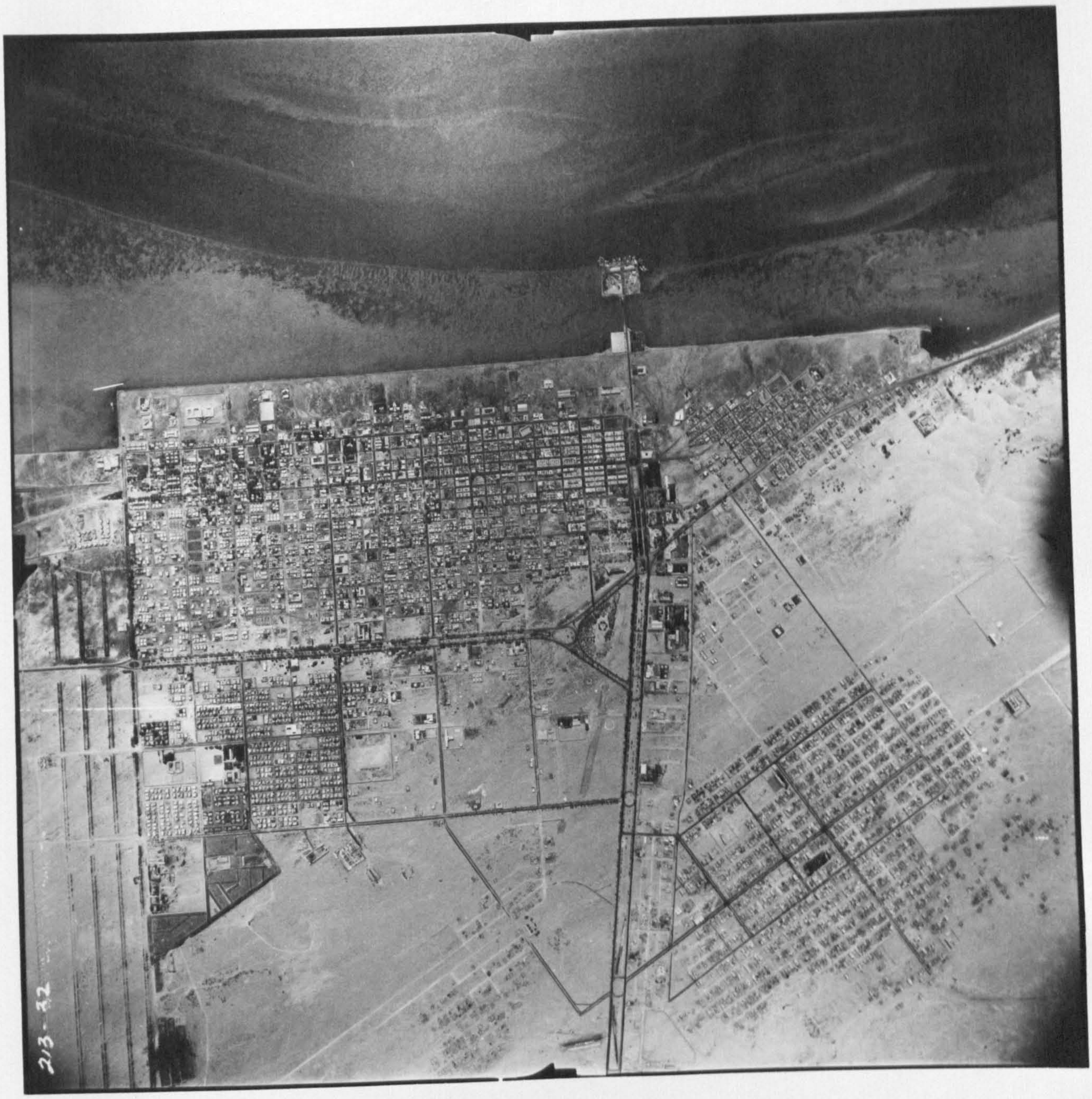


FIG.8.62. AL-KHOBAR IN 1973.

huts and tents.[10] After Al-Khobar became a commercial centre Al-Thuqbah grew rapidly into a modern town and a separate expansion. It now has modern housing, a sewage system, a water station, water distribution system, paved streets with street lighting, schools, a clinic and all the necessary facilities.

The New Plan

The original plan was drawn up for Al-Khobar by the Aramco surveyors, on a small scale:

(a) the plan covered a small area, not more than 400 metres square, north of the pier head and storage yard. The plan was laid out on a grid-iron pattern, with sub-division of land into blocks between 36.5 and 60.9 metres square in size, with separating streets 18 and 12 metres wide. The grid-iron pattern of the plan ran parallel to the shore line, from north to south,[11] this pattern itself being purely an alien importation by American planners laying out an area with no marked physical features.

(b) The section south of the pier, which includes the old part of Al-Khobar, known as Al-Subakhah Quarter, was also laid out on a grid-iron pattern on a small scale of blocks, and oriented to the north-west and south-east. The old buildings were demolished and plans were formed to enlarge this area and to open up new streets.

(c) The area to the south-west, known as Al-Thuqbah Suburb, was also planned on a grid-iron pattern and oriented to the north-west and south-east.

After 1962 the municipality planned and built on the area located north of Northern Al-Khobar, on a three line pattern, in an east-west direction, including a green belt plantation designed to control the moving sands to which Al-Khobar was exposed during the windy season. By 1970 reclamation along the shore had produced an additional some hundred metres of land for development. Much of this is being reserved for public use, but private buildings are also being constructed.

Al-Khobar was second in preference, after Dammam, by the employees of Aramco after the institution of the company's home ownership programme in 1951. The company gave its employees loans to build their homes, and it also gave aid to the government to encourage land development in the local communities by free distribution of building lots to these employees. The western part of Al-Khobar is a residential site, similar to that in the southern part of Dammam.

Planned Areas of Residential Expansion (See Fig.8.63)

By 1940 Al-Khobar was established as a town with two identifiable parts, Southern and Northern Al-Khobar, and the real expansion began in 1950, in Southern Al-Khobar, with the expansion of Area A from north to south, parallel to the coastline. Houses in this area were in high density blocks, built close together, and most densely built-up at the northern end of the area. The second stage of this first expansion was in Area B, Northern Al-Khobar, also parallel to the shore line and running from south to north, with a gap separating the two parts of the town. The groups of houses are much denser than in Southern Al-Khobar, with expansion inland of medium density in the west and light density in the north. The plan of these separate parts appears quite modern, with streets running at right-angles to each other, but there are no parks or gardens. The main road (the Dhahran road) runs between the two parts, and was divided into two roads, one to the south to Al-Ariziah shore, and the other to the pier of Al-Khobar. Although Areas A and B had both expanded by the 1960s, expansion in area B was much greater than in Area A, which had only medium density building. By the 1960s two new areas had been founded in Al-Khobar, Areas C and D; Area C, named Western Al-Khobar, had only a few groups of houses and was of medium density, while Area D, named Al-Thuqbah, was a separate expansion with large groups of houses. Even greater expansion took place in the 1970s; asphalt roads were laid linking the four areas; the areas them-

FIG.8.63. THE RESIDENTIAL EXPANSION IN AL-KHOBAR 1934 -1970

A- Old and the first extension.
B- First and the second ext.
C- Second and the third ext.
D- As a separate in a second ext.

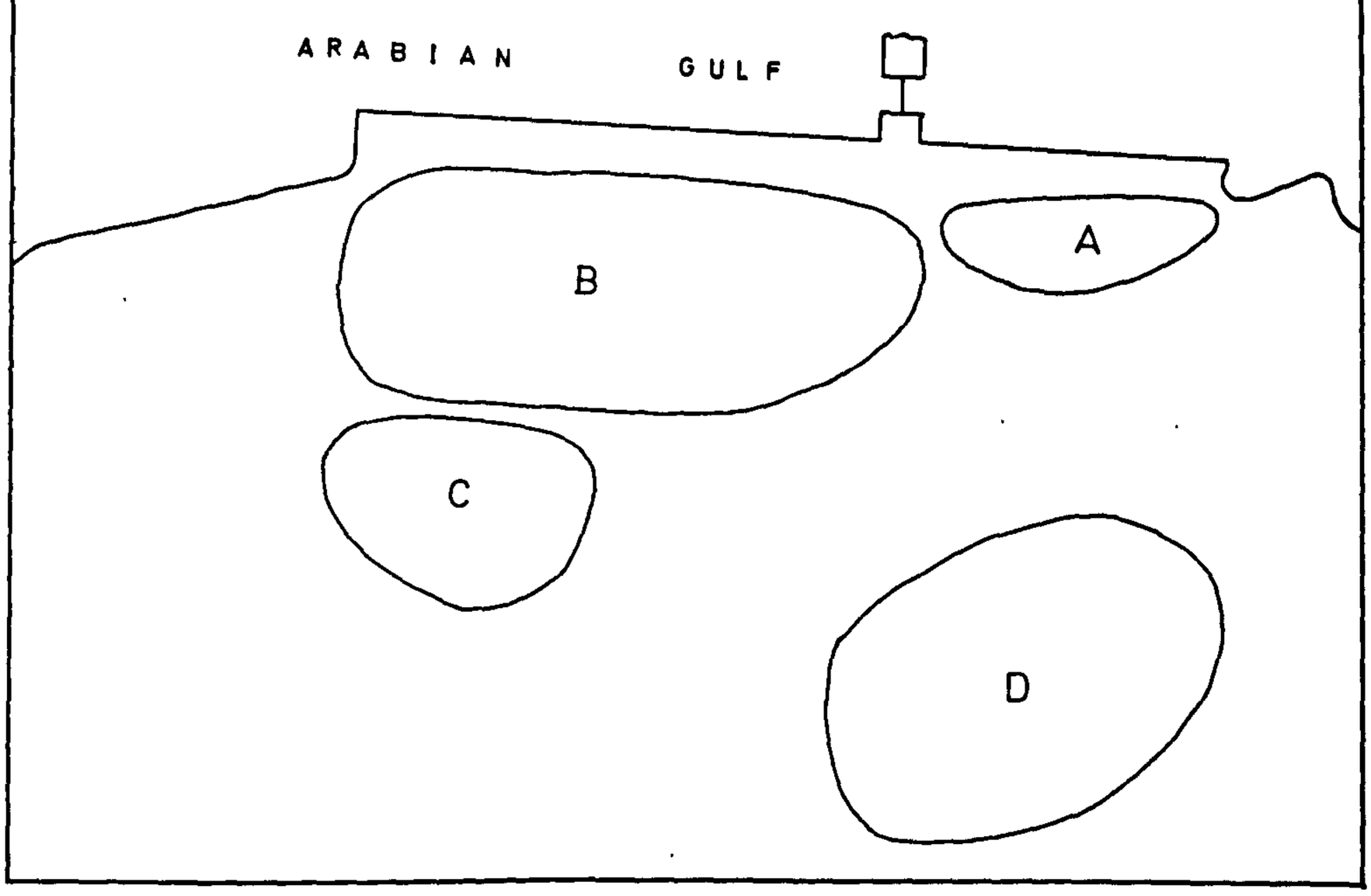
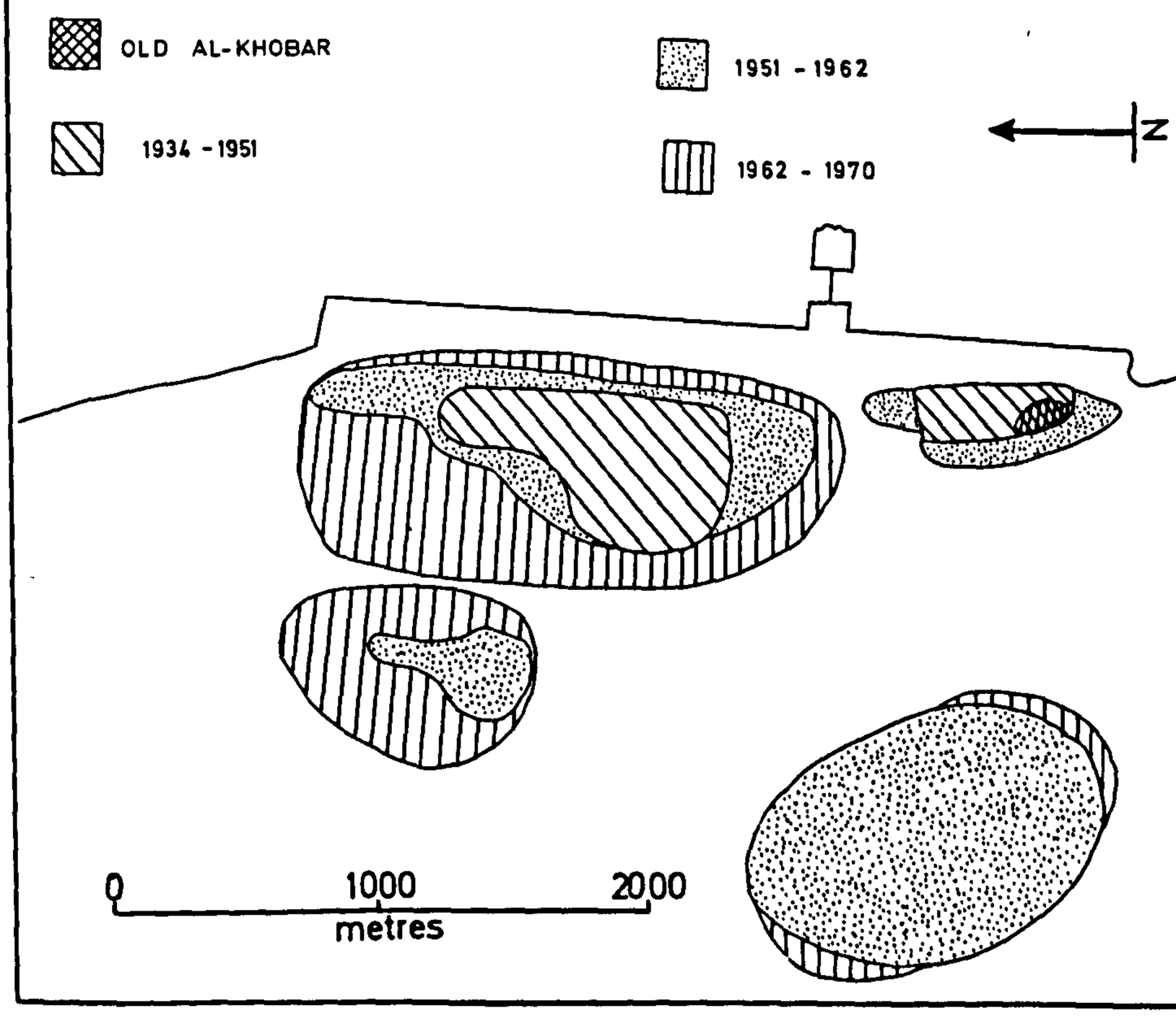


FIG. 8.64. THE SEQUENCE OF THE GROWTH IN AL-KHOBAR 1934 - 1970



selves were expanded in all directions to join up with each other, and Area B became the largest area in Al-Khobar. The houses in the centre of Area B were in high density blocks, and all businesses were concentrated in this area. Area C (Western Al-Khobar) was the area where most of the Aramco employees had built their homes, while Area D was the area mostly inhabited by local people. The four areas were separated by open spaces, reserved for public use and for residents to built upon in the future. The planning map of 1970 considered parks were already well represented, and emphasised the need for more residential expansion, including the area of reclaimed land along the shore being dried out in preparation for building. Even the land between the existing residential areas has been planned for even further residential expansion in the future, but no plans have yet been considered for industrial zones in Al-Khobar.

In a comparison of the maps of 1951, 1962 and 1970 the shape of the city of Al-Khobar showed marked differences between each year. The map of 1951 showed the two divisions of Northern and Southern Al-Khobar as two distinct villages occupying a firm silt beach ridge separated by an area of moving sand; in the 1962 map these two parts appeared to have been linked forming a rectangular shape the previous gap being filled by public buildings and a park and we see the new separate areas of Western Al-Khobar and Al-Thuqbah. The map of 1970 gives a more complete picture of the four parts, and it can be seen that the residential zones of the four areas are almost joined. Future expansion for Al-Khobar is planned to the west and south-west, but no plans are in progress for further expansion to the south, and the siting of the green belt plantation to restrain the sand during the windy season has limited any further northward expansion.

The Sequence of Growth (See Fig. 8.64)

The initial growth began in 1934, when the pier

was constructed, and continued at a slow rate until 1947. Prior to this, the fishermen's huts and mud houses had been built in a haphazard manner around the old village, but in 1947 the municipality of Al-Khobar and the oil company co-operated to plan the first real residential area. After this initial joint plan, growth increased rapidly, but it soon became apparent that growth in Area A, the south end of Southern Al-Khobar, was less controlled when compared with the controlled growth in the section north of this area. Growth in this section took place after the first grid plan of 1947, in the period 1947-57, when development was more closely controlled. (See Fig.8.65 map 1951).

The second stage of development came between 1951-62, in Areas A and B, by which time the new areas C and D had been developed. Expansion in Area B was faster than in Area A, and the new Area D was better developed than Area C (See Fig.8.66, map 1962). By 1970 expansion in all directions had almost amalgamated the areas to form a complete unit, with the exception of Area D (Al-Thuqbah) which became a separate expansion. The most recent expansion in the 1970s has been in area B, in a west and north-west direction, and Western Al-Khobar (Area C) has seen greater expansion than any other area in 1970; this is also true of Area D, but here expansion has been limited to a few groups of houses, and there has been no expansion whatever in Area A during this period (See Fig.8.67, map 1970).

Housing

Southern Al-Khobar (Al-Subaikha Quarter) which was the original village of Al-Khobar built by the Dawasir people, is the oldest part of the city. The houses in the main street of this area are the oldest houses, almost invariably built with a ground floor only, constructed in the traditional style from mud and stones cut from the sea, and with a roof made from palm leaves. Windows are traditional in form, open, without glass, but with shutters, and the window at the front of the

CITY MAP OF AL-KHOBAR
EASTERN PROVINCE
1962.

ARABIAN GULF

N

TO DAMMAM

TO DAMMAM

cemetery

LEGEND

- RESIDENTIAL AREA
- PLAN AREA
- SCHOOLS B. & G.
- MOSQUE
- GOVERNMENT ZONE
- OLD HUTS
- HOSPITAL
- PARK & GREEN AREA
- GARDENS
- SHORE LINE

AL-JHUQBAR

cemetery

TO DHAHRAN

500 0 500 1000 1500
Metres

500 0 500 1500
Feet

FIG 8.65. AL KHOBAR EXPANSION IN 1951

N

PP

TO DHAHRAN

FIG 8.66 AL-KHOBAR EXPANSION IN 1962.

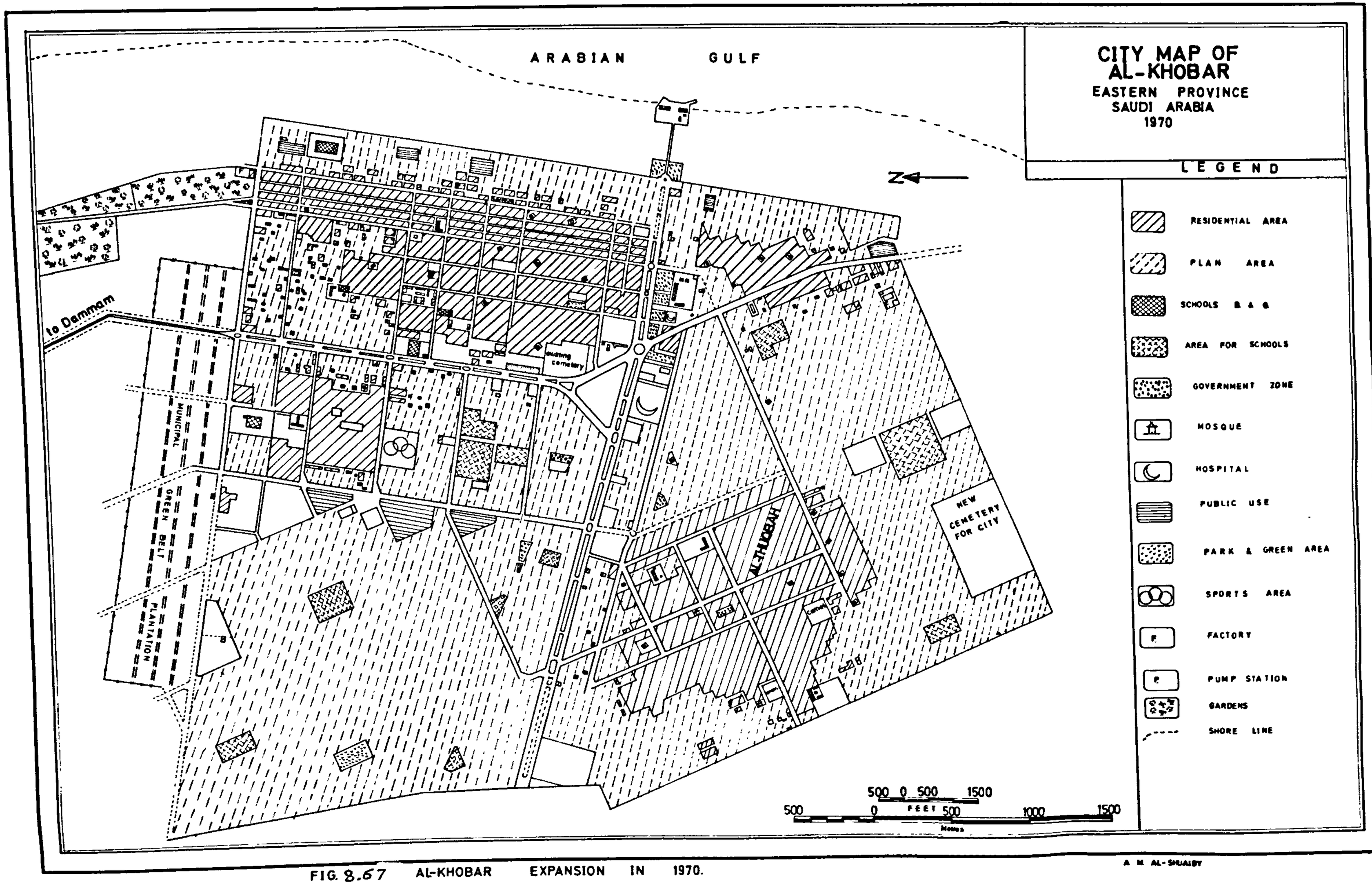


FIG. 8.67 AL-KHOBAR EXPANSION IN 1970.

house being made from wood extending along almost the whole of the front wall. This style of window was very popular as more cool air could circulate in the hot summer; these windows have been replaced in the modern houses by wide balconies, but in the old Al-Subaikha Quarter of Al-Khobar the old and the new designs can be seen side by side in the same street (See plates Fig.8.68).

The more recently developed areas of Northern and Western Al-Khobar have almost all modern houses and villas of not more than two or three floors and some multi-storey buildings of five to eight floors. These multi-storey flats and other buildings are normally the homes of the foreign employees of the oil company, and are also used for companies' offices, as Saudi families usually occupy separate houses or villas. In the very centre of Al-Khobar, the multi-storey buildings usually have shops on the ground floor.

The more recently built modern houses are usually constructed of cement, concrete blocks or bricks (See Table 8.55). Doors and windows are made from aluminium and wood, and as has been previously explained, are very different in style from the traditional large windows in older houses, since their function is now only to give light rather than ventilation, with the coming of air-conditioning.

TABLE 8.55
BUILDING MATERIALS USED IN AL-KHOBAR (1972)

Materials	Construction	Alteration	Compounds	Total	%
Cement	401	27	-	428	59.5
Stones	-	-	-	-	
Mud	-	-	-	-	
Block and Bricks	109	35	147	291	40.5
Others	-	-	-	-	
TOTALS	510	62	147	719	100

Source: Ministry of Finance, Central Department of Statistics

1. Old houses in Southern Al-Khobar.

2. Old houses in Southern Al-Khobar.

3. New houses in Northern Al-Khobar.

4. New houses in Northern Al-Khobar.

FIG. 8.68. OLD AND NEW HOUSES IN AL-KHOBAR.

Streets

The streets of Al-Khobar are generally straight and meet each other at right-angles, due to the city being designed in a grid-iron shape. Many of them, especially those in the city centre, such as the divided artery streets, connect with major inter-urban roads to Dammam and Dhahran. The undivided streets vary in width from 3-5 metres and some are as wide as 12 metres; the divided artery streets, particularly those which connect with the major roads to Dammam and Dhahran, are as wide as 18 metres. Concrete footpaths are found on the main streets, and most, though not all, are asphalted and have street lighting (See Streets, Chapter 8, Introduction).

Al-Khobar Pier

Al-Khobar Pier is small and handles a number of smaller specialist vessels, eg fishing fleets and coastal ships, and only relatively small amounts of incoming cargo are handled. The most important shipments through the pier are consumer items from the free zone facilities of Bahrain.[12] Between three and ten boats call daily at Al-Khobar pier, carrying cargo and passengers from Bahrain and other Gulf States. Al-Khobar pier shares with the main sea ports of Saudi Arabia the import of goods such as cement, rice and foodstuffs. In 1968 about 67,500 tons of cargo were imported and 13,700 tons exported. In the same years, the number of passengers passing through the pier to and from Bahrain and other countries was approximately 73,205. At the pilgrimage time, thousands of Muslim pilgrims pass through Al-Khobar both before and after making their pilgrimage to Mecca, and in 1968 approximately 6,200 pilgrims entered, and left the port. The port itself comes under the jurisdiction of the Ministry of Finance, and there are no plans at the present time for further expansion of facilities.[13]

Commercial Activities

Al-Khobar is involved with Dammam as the commercial centre for

Eastern Province. It is the main retail shopping centre for the oil workers and together with Dammam is the third most important market in Saudi Arabia, after Jeddah and Riyadh. Today, Al-Khobar's position as the regional retail centre is more dynamic, progressive and exuberant. With the expansion of the petroleum industry in the Eastern Province, independent import houses and branches of Riyadh and Jeddah firms were established and have multiplied in Al-Khobar and Dammam. However, some of the import houses, retail and wholesale firms have been created locally as a result of expansion in Al-Khobar.

The increasing demand for a wide variety of imported goods after the Second World War, attracted merchants to Al-Khobar to establish trade and industrial establishments and open businesses for the oil company and their employees, and the increasing number of commercial and industrial establishments reflects the growth of Al-Khobar, particularly over the last few years (See Table 8.56, showing the increase in number of establishments in 1967 and 1971).

TABLE 8.56
GROWTH IN NUMBER OF ESTABLISHMENTS IN AL-KHOBAR

Elements	1967	1971	Rise	% Increase
Establishments	1393	1972	479	34.4
Workers	5311	7782	2471	47.4
Average No. of workers per establishment	3.8	4.2	5.2	

Source: Ministry of Finance, Central Department of Statistics

The businesses in Al-Khobar account for about 18.1% of the total establishments in the Province, while Al-Khobar and Dammam are both commercial centres, Al-Khobar's trade is mostly retail and there is a greater variety of luxury and fashion goods on sale than in Dammam. Al-Khobar has a higher percentage of commercial establishments (79.9%) and industrial establishments account for only 18.9% of the total; the remaining 1.2% are transport and storage businesses.[14] (See Table 8.57)

TABLE 8.57

SIZE AND TYPE OF ESTABLISHMENTS IN AL-KHOBAR (1971)

Establishments	Number	%	Employees	%	Average number of workers per establishment
Commercial	1106	79.9	5204	78.9	4.7
Industrial	262	18.9	1272	19.3	4.9
Transport & Storage	16	1.2	117	1.8	7.3
TOTALS	1384	100	6593	100	4.8

Source: Ministry of Finance, Central Department of Statistics

The commercial establishments in Al-Khobar and Dammam cannot be separated entirely, as both cities have grown simultaneously for the following reasons:

(a) Dammam and Al-Khobar existed alongside each other among the oil fields and near the headquarters of the oil company.

(b) Each city formed a nucleus surrounded by oil fields and both are used for shopping by the employees of the oil companies.

(c) Dammam's specialisation in foodstuffs and other local goods gives it the primary importance as a commercial centre for these specific goods.

(d) Al-Khobar's speciality goods are clothing and luxury and other household goods, and in this respect it has the greater importance of the two.

74.5% of all commercial establishments are small private individual companies, owned by local people and run as a single, independent establishment. They are mainly retail stores selling a variety of goods, as well as restaurants, hotels, estate agents, and construction and business services. The second category is that of branches of larger businesses centred in Dammam, Riyadh and Jeddah in the Western Province, and these account for 17.4% of the businesses in Al-Khobar. They are mainly wholesale, insurance (mainly for expatriates), and financial establishments. Headquarters of branch

establishments situated at Al-Khobar are very few compared with independent establishments, and account for only 8.1% of the total number (See Table 8.58).

TABLE 8.58
DISTRIBUTION OF COMMERCIAL ESTABLISHMENTS IN AL-KHOBAR (1971)

Establishments	Number	%	Independent Establish-ments	Headquarter Establish-ments	Branch Establish-ments
Wholesale	29	2.6	8	4	17
Retail	707	63.9	544	64	99
Restaurants & Hotels	60	5.4	53	-	7
Commercial Businesses	14	1.3	9	-	5
Financial Businesses	14	1.3	4	3	7
Insurance Businesses	3	0.3	1	-	2
Estate Agents	41	3.7	23	4	14
Construction	48	4.3	31	7	10
Services	190	17.2	151	8	31
TOTALS	1106	100	824	90	192
Percentages		100	74.5	8.1	17.4

Source: Ministry of Finance, Central Department of Statistics

Classification of commercial establishments by number of employees shows that 49.5% have only one employee, 38.8% have between two and five employees, 6.8% have between five and ten employees and the remainder have between ten and one hundred workers. Firms employing fifty and over are very few in number, and account for less than 1% of the total. These percentages reflect the size of establishments in Al-Khobar, which are mostly only small firms employing a small number of people. (See Table 8.59).

In an examination of the type of employee working in the commercial establishments, it was found that these were divided into two categories - wage paid and unpaid. In 1971 about 82.3% of all employees were paid, and 17.7% unpaid, and when compared to the figures for Qatif, the percentages of wage paid employees is very high. (See Table 8.60).

TABLE 8.59
CLASSIFICATION OF COMMERCIAL ESTABLISHMENTS
BY NUMBER OF EMPLOYEES (1971)

Establishments	1	2-4	5-9	10-19	20-49	50-99	100+	Total
Wholesale	9	14	4	1	1	-	-	29
Retail	414	258	29	3	3	-	-	707
Restaurants & Hotels	14	33	8	5	-	-	-	60
Commercial Businesses	6	5	-	-	3	-	-	14
Financial Businesses	2	5	-	1	4	2	-	14
Insurance	-	1	2	-	-	-	-	3
Estate Agents	18	16	2	5	-	-	-	41
Construction	16	14	4	3	3	2	6	48
Services	69	83	26	6	4	1	1	190
TOTALS	548	429	75	24	18	5	7	1106
Percentages	49.5	38.8	6.8	2.2	1.6	0.5	0.6	100

Source: Ministry of Finance, Central Department of Statistics

TABLE 8.60
TYPE OF EMPLOYEES IN COMMERCIAL ESTABLISHMENTS (1971)

Establishments	Unpaid	Paid	Total
Wholesale	16	104	120
Retail	642	696	1338
Restaurants & Hotels	49	169	218
Commercial Businesses	12	108	120
Financial Businesses	5	278	283
Insurance	-	14	14
Estate Agents	28	124	152
Construction	46	2065	2111
Services	124	724	848
TOTALS	922	4282	5204
Percentages	17.7	82.3	100

Source: Ministry of Finance, Central Department of Statistics

Industrial Activities

As with its commercial activity, Al-Khobar's industrial activity is closely linked with Dammam; in 1971, industrial establishments accounted for 18.9% of the total. Clothing manufacturers and textile firms made up 33.1% of this total and most were independent firms owned by one or two individuals. Metal establishments occupied second place with 22.1% of the total; carpentry and furniture firms were third, with 14.4% and almost all these were independent small firms (See Table 8.61).

TABLE 8.61
DISTRIBUTION OF INDUSTRIAL ESTABLISHMENTS AND TRANSPORT AND STORAGE IN AL-KHOBAR (1971)

Establishment	Number	%	Independent Establishments	Headquartor Establishments	Branch Establishments
Agriculture	2	0.7	-	-	2
Petrol & Natural Gas	2	0.7	-	1	1
Mineral Products	1	0.4	-	-	1
Food Industry	21	7.5	18	2	1
Textile & Clothing	92	33.1	85	-	7
Carpentry & Furniture	40	14.4	37	-	3
Paper Products and Printing	10	3.6	8	1	1
Chemical Industry	1	0.4	1	-	-
Metal Workshops	63	22.7	48	2	13
Electricity	3	1.1	-	1	2
Water Network	2	0.7	-	-	2
Other Industries	25	9.0	18	-	7
Transport & Storage	16	5.7	4	2	10
TOTALS	278	100	219	9	50

Source: Ministry of Finance, Central Department of Statistics

In these industrial establishments are included the large industrial firms situated only within the city of Al-Khobar (eg Dairy Plant).

The classification of industrial establishments by number of employees shows that 34.2% employed only one worker; 44.2% employed between two and four workers, 12.9% of the total employed between

five and ten workers and the remainder had employod between ten and one hundred and over workers. (See Table 8.62)

TABLE 8.62
CLASSIFICATION OF INDUSTRIAL ESTABLISHMENTS AND TRANSPORT AND STORAGE BY NUMBER OF EMPLOYEES (1971)

Industry	1	2-4	5-9	10-19	20-49	50-99	100+	Total
Agriculture	-	1	-	1	-	-	-	2
Petrol & Natural Gas	-	-	1	-	-	1	-	2
Minerals	-	-	-	-	-	1	-	1
Foodstuffs	2	11	5	1	1	-	1	21
Textiles & Clothing	52	40	-	-	-	-	-	92
Carpentry & Furniture	13	18	9	-	-	-	-	40
Paper & Printing	3	3	-	2	2	-	-	10
Chemicals	-	-	1	-	-	-	-	1
Metal Workshops	15	33	13	1	1	-	-	63
Electricity	1	-	-	1	1	-	-	3
Water Network	-	2	-	-	-	-	-	2
Others	7	8	4	4	2	-	-	25
Transport & Storage	2	7	3	3	1	-	-	16
TOTALS	95	123	36	13	8	2	1	278
Percentages	34.2	44.2	12.9	4.7	2.9	0.7	0.4	100

Source: Ministry of Finance, Central Department of Statistics

In 1971 about 78.4% of the total establishments in Al-Khobar employed less than four workers, and this is an indication of the small size of businesses in the city, as industrial development in the region is still in its early stages of development, partly due to the small population of Al-Khobar and its surrounding area, and one of the main problems facing industrial development is the shortage of manpower.

Industrial employees also fall into two categories, wage paid (85.9%) and unpaid (14.1%) (See Table 8.63).

Distribution of Special Functions

Al-Khobar is well known as a commercial centre in Eastern Province cities, and it also has small industries such as craft workshops and othor light industrios. Both commercial and industrial

TABLE 8.63
TYPE OF EMPLOYEES IN INDUSTRIAL ESTABLISHMENTS AND TRANSPORT AND STORAGE IN AL-KHOBAR (1971)

Establishments	Unpaid	Paid	Total
Agriculture	-	13	13
Petrol & Natural Gas	-	66	66
Mineral Products	-	67	67
Foodstuffs	8	331	339
Textiles & Clothing	92	50	142
Carpentry & Furniture	34	78	112
Paper Products & Printing	9	84	93
Chemicals	-	5	5
Metal Workshops	39	178	217
Electricity	-	61	61
Water Network	-	4	4
Others	3	142	145
Transport & Storage	11	114	125
TOTALS	196	1193	1389
Percentages	14.1	85.9	100

Source: Ministry of Finance, Central Department of Statistics

activities are very similar to those in Dammam, but Al-Khobar specialises more in commercial establishments with non-food items such as cloth, clothing, luxury goods, jewellery and watches.

Shopping Centres (Fig.8.69, photo 1973)

Al-Khobar has one main and three sub-shopping centres. The main centre is situated in Northern Al-Khobar and has nine streets running from south to north, with others crossing them from east to west. The sub-centres are smaller both in number of customers and variety of goods on sale, and are more traditional, particularly those in Al-Sobaikah Quarter (the oldest part of Al-Khobar), and Al-Thuqbah. The centre of Al-Sobaikha is in the high street, the oldest street in the Quarter, which was the original main street of Al-Khobar prior to the discovery of oil and the re-location of the centre to its new position in the north. The centres of Al-Thuqbah and Al-Sobaikah are similar, but the Al-Thuqbah retail centre

FIG.8.69. THE MAIN SHOPPING CENTRE IN AL-KHOBAR.

sells more traditional goods, as most inhabitants of this quarter are Bedouins. The third sub-centre is in western Al-Khobar and differs from the two former centres as it is more recently established; it retails only a small variety of goods and was built especially for the oil employees who live in Western Al-Khobar.

(a) The Main Shopping Centre: its main streets are Khalid, Mohammed, Nasire, Faisal and Saud Streets, along with the streets running from east to west known only by numbers (1, 2, 3 Streets and Dhahran Road) Several specialised functional areas are found in this area, the most important being the retail shops and ground floor stores for cloth, men's, women's and children's clothing, shoes and jewellery; these stretch the length of Khalid Street, the main street of Al-Khobar (See plates Fig. 8.70). Khalid Street also has shops for cosmetics, and perfumes, kitchen ware, electrical goods, chemists, antiques, furniture, carpets, photography and car showrooms. Next to Khalid Street, to the east, is Mohammed Street, with more general shops such as general dealers, greengrocers, grocers, bookshops, kitchen ware retailers, photographers, men's hairdressers, tailors and hand crafts. The other streets, eg Faisal Street, have tailors shops, building materials, kitchen ware, grocers and motor spares. This centre also has several company offices, eg travel agents, banks and money-changers, as well as hotels and hospitals. (See Table 8.64 for classification of shops and other businesses.)

(b) Secondary-shopping Centres: the first of these centres is in Al-Sobaikha quarter; it is small and shops are almost all in the high street or nearby. There are not more than 105 shops, mainly general shops or grocers (See Table 8.65).

The second independent secondary-shopping centre is in Al-Thuqbah, and the system here is different from the main centre in northern Al-Khobar; the small local shops are mainly traditional in style, as most of the residents of this area are Bedouins. A variety of shops

FIG.8.70. ONE-FLOOR CLOTHES STORE AT KHALID STREET.

TABLE 8.64

DISTRIBUTION OF BUSINESSES IN THE MAIN SHOPPING CENTRE IN AL-KHOBAR (1973)

Group	Type of Shops	Khalid Street	Mohammed Street	Nasir Street	Faisal Street	Saud Street	Dhahran Road	No.1 Street	No.2 Street	No. 3 Street	Total
1	Wholesale Foodstuffs	-	-	-	-	1	-	-	1	-	2
2	Retail Foodstuffs	-	-	-	-	-	-	-	1	-	1
3	Groceries	5	12	4	10	4	-	4	3	4	46
	Greengroceries	-	9	-	-	-	-	-	1	1	11
	Bakers	2	3	1	-	-	-	-	1	1	8
	Poultry/Egg Dealers	-	3	-	-	-	-	-	-	-	3
4	Cloth	14	1	-	-	-	-	1	-	-	16
	Women & Children's Clothes and Shoes	33	-	3	2	-	-	4	-	1	43
	Men's clothes	11	-	-	1	-	-	-	-	-	12
	Tailors	-	14	8	18	7	-	5	2	2	56
5	Kitchen Ware	3	6	3	10	5	-	5	4	5	41
	Electrical Goods	11	4	1	3	-	-	2	-	6	27
	Sewing Machines	-	-	-	-	-	1	-	-	-	1
	Typewriters	-	1	-	-	-	-	-	-	-	1
	Office Furniture	1	-	-	-	-	-	-	-	-	1
	Household Furniture	4	3	5	1	-	-	1	1	-	15
	Carpets	4	-	-	-	-	-	-	-	-	4
	Decorators	1	-	2	-	-	-	-	-	-	3
6	Cosmetics and Perfume	6	1	-	-	-	-	-	-	-	7
	Jewellery and Watches	14	2	-	-	-	-	2	-	-	18
	Antiques	6	1	-	-	-	-	3	-	-	10
	Watch Repairs	3	2	-	-	-	-	-	-	-	5
	Opticians	1	-	-	1	-	-	-	-	-	2
7	Chemists	5	-	-	-	-	-	1	1	2	9
	Medical Tools	-	1	-	-	-	-	-	-	-	1
	Bookshops	-	7	-	1	-	-	-	2	1	11
	Records/Music	-	1	-	-	-	-	-	-	-	1
	Toys	1	-	-	-	-	-	1	-	-	2
8	Restaurants	6	2	-	1	-	-	1	-	-	10
	Fawwal Shops	-	2	-	-	-	-	-	-	1	3
	Sandwich Shops	1	1	-	-	-	-	-	-	1	3
	Coffee Shops	3	3	-	-	4	4	2	2	4	22
	Drinks Shops	-	2	-	-	-	-	-	-	-	2
9	Photographers	9	8	1	-	-	-	-	-	-	18
	Men's Hairdressers	3	8	-	3	1	2	-	-	-	17
	Launderers	-	3	-	2	2	-	-	-	2	9
10	Building Materials	-	-	-	7	7	-	-	-	1	15
	Ships Tools	2	-	-	-	1	-	-	-	-	3
	Gas Dealers	-	-	-	-	-	-	-	-	2	2
	Motor Spares	2	-	-	9	7	-	-	-	1	19
	Plant Shops	-	1	-	-	-	-	-	-	-	1
11	Car Showrooms	6	1	-	-	-	-	1	-	-	8
	Warehouses	-	3	-	-	9	-	-	5	-	17
12	Miscellaneous Shops	4	34	-	2	36	-	5	12	26	119

TABLE 8.64 continued

Type of Workshops	Khalid Street	Mohammed Street	Nasir Street	Faisal Street	Saud Street	Dhahran Road	No.1 Street	No.2 Street	No.3 Street	Total
Handicrafts	7	-	-	1	1	-	-	-	1	10
Upholsterers	-	-	-	-	12	-	-	-	-	12
Car Upholsterers	4	-	-	-	-	-	-	-	2	6
Carpentry	-	-	4	-	10	-	1	-	-	15
Joiners	-	-	1	-	2	1	-	-	-	4
Door and Window Frames and Glass Shops	-	-	-	2	-	-	-	1	-	3
Blacksmiths	-	-	-	5	1	-	-	-	2	8
Printing	-	-	-	--	2	-	-	-	-	2
TV/Radio Repairs	1	-	1	3	-	-	-	-	1	6
Refrigerator Repairs	1	3	-	2	-	-	-	-	1	7
Puncture Repairs	4	-	-	-	-	-	-	-	2	6
Garages	7	-	14	2	-	-	-	2	-	25
Radiator Repairs	-	-	-	-	-	-	2	-	-	2
Type of Offices										
Government	-	-	-	-	-	2	-	-	-	2
Banks	2	-	1	-	2	-	3	-	2	10
Money Changers	2	-	-	-	-	-	5	-	-	7
Company Offices	7	2	3	-	15	11	2	-	8	48
Travel Agents	8	-	1	-	-	1	1	-	-	11
Estate Agents	-	-	-	-	-	-	5	-	-	5
Post Office	1	-	-	-	-	-	-	-	-	1
Police Station	-	-	-	-	-	-	-	-	1	1
Type of Social Services										
Schools	-	-	-	-	-	1	-	-	-	1
Hospitals	-	-	1	-	-	-	-	-	2	3
Hotels	1	-	1	-	-	-	2	1	-	5
Mosques	1	1	-	1	1	-	-	1	-	5
Surgeries	-	-	-	-	-	-	-	-	1	1
Fire Station	-	-	-	-	-	1	-	-	-	1
Petrol Station	1	-	-	-	-	-	2	1	-	4
Transport Stations	-	-	-	-	-	2	-	-	-	2
TOTALS	225	145	56	88	134	28	61	42	84	863

Source: Fieldwork

TABLE 8.65

DISTRIBUTION OF BUSINESSES IN AL-SOBAKHA CENTRE (SOUTHERN AL-KHOBAR) 1973

Group	Type of Shops	Old Suq	Ain Dar Street	Al-Rahka Street	Al-Aziz Street	Darin Street	Shariq No.2	Shariq No.3	Total
3	Groceries	2	4	2	1	2	1	-	12
	Greengroceries	-	-	-	-	-	1	-	1
	Bakers	3	-	1	-	-	2	-	6
4	Women's/Children's Clothes	1	-	-	-	-	-	-	1
	Tailors	2	-	-	-	-	-	-	2
5	Kitchen Ware	-	-	-	-	1	-	-	1
7	Records/Cassettes	-	-	1	-	-	-	-	1
8	Coffee Shops	1	2	-	-	-	1	1	5
	Restaurants	-	-	1	-	3	-	-	4
	Fawwal	1	-	-	-	-	-	-	1
9	Men's Hairdressers	2	1	-	-	-	-	-	3
	Launderers	2	-	-	4	-	-	-	6
12	Miscellaneous Shops	15	8	10	3	5	2	2	52
	Type of Workshops								
	Founders	1	-	-	-	-	-	-	1
	Bicycle Repairs	1	-	-	1	-	-	-	2
	Type of Social Services								
	Schools	1	-	-	-	-	-	-	1
	Mosques	-	2	-	2	-	1	1	6
	TOTALS	31	17	15	10	11	17	4	105

Source: Fieldwork

sell miscellaneous goods and men's, women's and children's clothing, and it is common in this area to find one shop selling different articles side by side, such as cotton mattresses and pillows, kitchen ware etc. There are also bakers, tailors, the seed market, sheep market, doctor's surgery, a chemist and a health centre. Of the 273 shops in this centre 46.5% are situated in Yanbu Street, the remainder are spread around the surrounding area (See Table 8.66).

The third sub-shopping centre has the smallest number of shops retailing only a limited variety of goods. It is situated in Western Al-Khobar (the oil employees' town site) and it was planned as a shopping centre; one covered building houses the fifteen or so shops and there are only one or two shops selling each commodity (See Table 8.67).

A comparison of the business structure in the main shopping centre and the three sub-shopping centres clearly demonstrates that wide differences exist in degrees of functional specialisation and quality ratings of business establishments according to the location of each centre, the type of inhabitants of the surrounding area and their varying income groups.

The first and main shopping centre is located in the centre of the main residential area in northern Al-Khobar- have most of the foreign population with high incomes and the main company offices are located. The types of goods in quality and price are very modern and of western style aimed at the surrounding market area. It differs from other shopping centres in these respects. The secondary shopping centre of the southern Al-Khobar carries goods of type and price associated with lower cost housing and lower incomes in a population concentration which includes a high proportion of less skilled workers both Saudi Arabian and Yemeni.

In western Al-Khobar, a very small but growing shopping centre appears in the range of goods offered to cater for a newer housing area with a high and medium income population. The shopping centre of Al-Thuqbah is different again from the three others, because of its type of population where the majority are bedouin stock still maintaining in some cases rural

TABLE 8.66

DISTRIBUTION OF BUSINESSES IN AL-THUQBAH CENTRE (1973)

Group	Type of Shops	Mecca Street	St.No. 15	St.No. 14	Yanbu Street	St.No. 13	Total
1	Wholesale Foodstuffs	-	2	-	2	-	4
2	Retail Foodstuffs	-	-	-	9	-	9
	Retail Market (Suq)	-	-	1	-	-	1
	Seed Market (Suq)	-	-	-	1	-	1
3	Groceries	3	3	1	5	-	12
	Greengroceries	-	-	-	3	-	3
	Bakers	4	4	-	7	-	15
	Sheep Market	1	-	-	-	-	1
4	Cloth	-	-	-	3	-	3
	Clothing	-	-	-	28	1	28
	Cloth & Mattresses	-	-	-	1	-	1
	Ubi (Traditional clothing for women)	-	-	-	1	-	1
	Tailors	-	5	-	8	-	13
5	Kitchen Ware	-	-	-	10	1	10
	Electrical Goods	1	2	1	4	1	6
	Furniture	-	-	-	1	-	1
	Decorators	1	-	-	-	-	1
6	Cosmetics & Perfumes	-	-	-	1	-	1
	Leather Goods	-	-	-	1	-	1
	Watches	-	-	-	1	-	1
7	Chemists	1	-	-	-	-	1
	Bookshops	-	-	-	1	-	1
8	Restaurants	2	3	-	9	-	14
	Coffe Shops	2	4	-	1	-	7
9	Photographers	-	-	-	2	-	2
	Founders	-	1	-	-	-	1
	Men's Hairdressers	-	4	-	3	-	7
	Launderers	3	5	2	2	-	12
10	Building Materials	-	1	-	-	-	1
12	Miscellaneous	18	17	6	13	3	57
	Type of Workshops						
	Bricks and Blocks	4	-	-	-	2	6
	Carpentry	-	1	-	-	-	1
	Founders	-	1	-	-	-	1
	Windows & Frames, Glass	-	-	1	-	-	1
	Blacksmiths	2	2	-	-	-	4
	Battery Repairs	1	-	-	-	-	1
	Garages	6	-	-	2	2	10
	Puncture Repairs	2	3	-	-	2	7
	Upholsterers	1	1	-	3	1	5
	Bicycle Repairs	1	1	-	-	-	2
	TV and Radio Repairs	-	-	-	2	-	2
	Type of Offices						
	Business Offices	3	-	-	-	-	3
	Post Office	-	-	-	1	-	1
	Estate Agents	1	1	-	-	-	2
	Type of Social Services						
	Schools	1	1	-	1	-	3
	Health Centre	-	1	-	-	-	1
	Surgeries	2	-	-	-	-	2
	Mosques	1	3	-	1	-	5
TOTALS		60	66	11	127	9	273

animal-keeping ways of life or in other cases are low-skill, low-income, temporarily employed (See Fig. 8.71).

TABLE 8.67
BUSINESS IN THE CENTRE OF WESTERN AL-KHOBAR (1973)

Group	Type of Shops	Number
3	Grocers	2
	Greengrocers	1
	Bakers	2
4	Women's/Children's Clothes	1
5	Kitchen Ware	1
	Electrical Goods	1
7	Bookshops	1
9	Men's Hairdressers	1
	Launderers	2
10	Building Materials	1
	Type of Offices Travel Agents	1
	Type of Workshops TV/Radio Repair Shops	1
	TOTALS	15

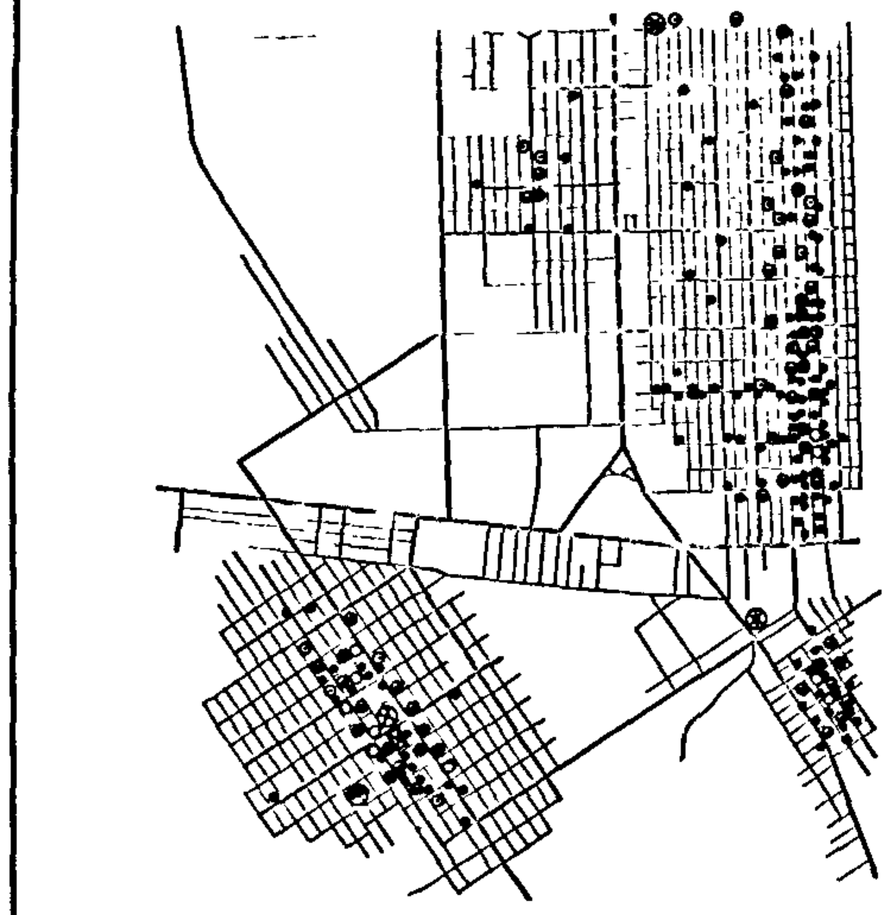
Source: Fieldwork

Public Utilities

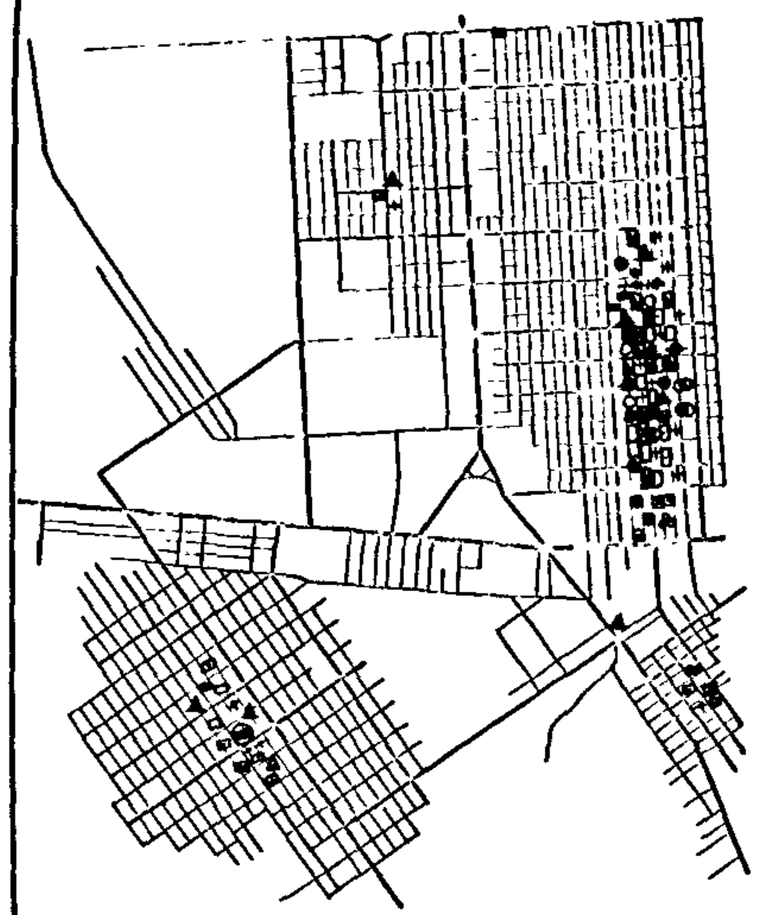
Since 1950, great emphasis has been placed upon the provision or improvement of public utilities such as piped drinking water, with storage tanks and pump stations, sewage disposal, and electricity etc. All these have affected the development of Al-Khobar; Aramco Oil Company had already established a water network and sewage disposal in its employees' town site in the west of Al-Khobar, and had also built water storage tanks for the network.

(a) Water: in the early stages of development Al-Khobar was supplied with water from a well in Al-Thuqbah suburb in the south-west, about 4 Km from the coast of Al-Khobar. By 1973 the number of houses receiving piped water from a new system planned in 1960 3265, or about 44.2% of the total.[15]

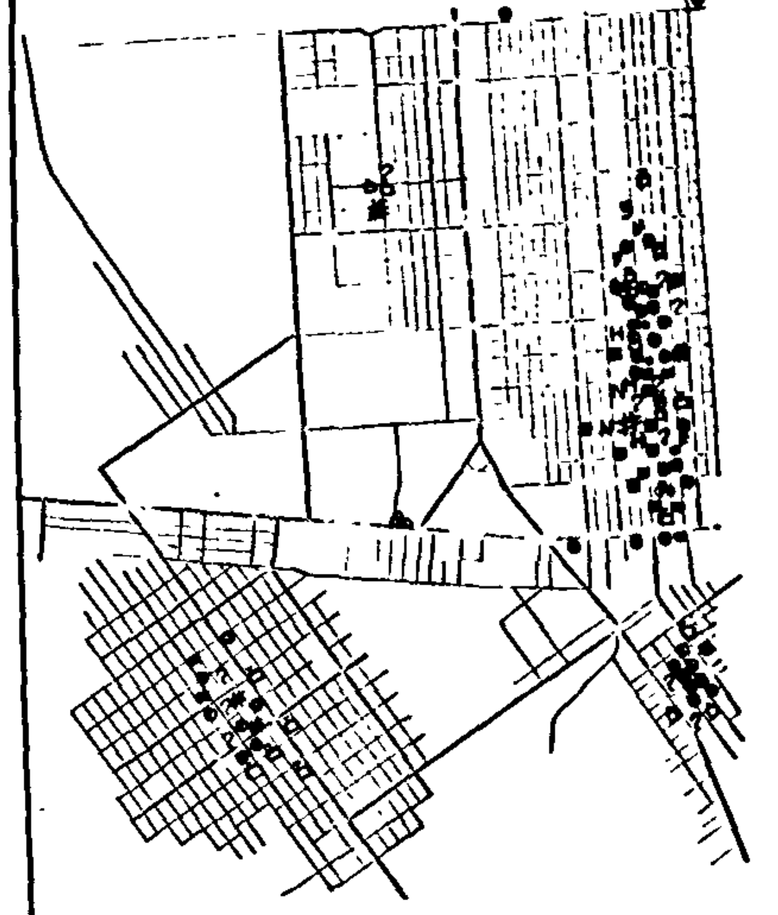
At present Al-Khobar is supplied from three artesian wells of



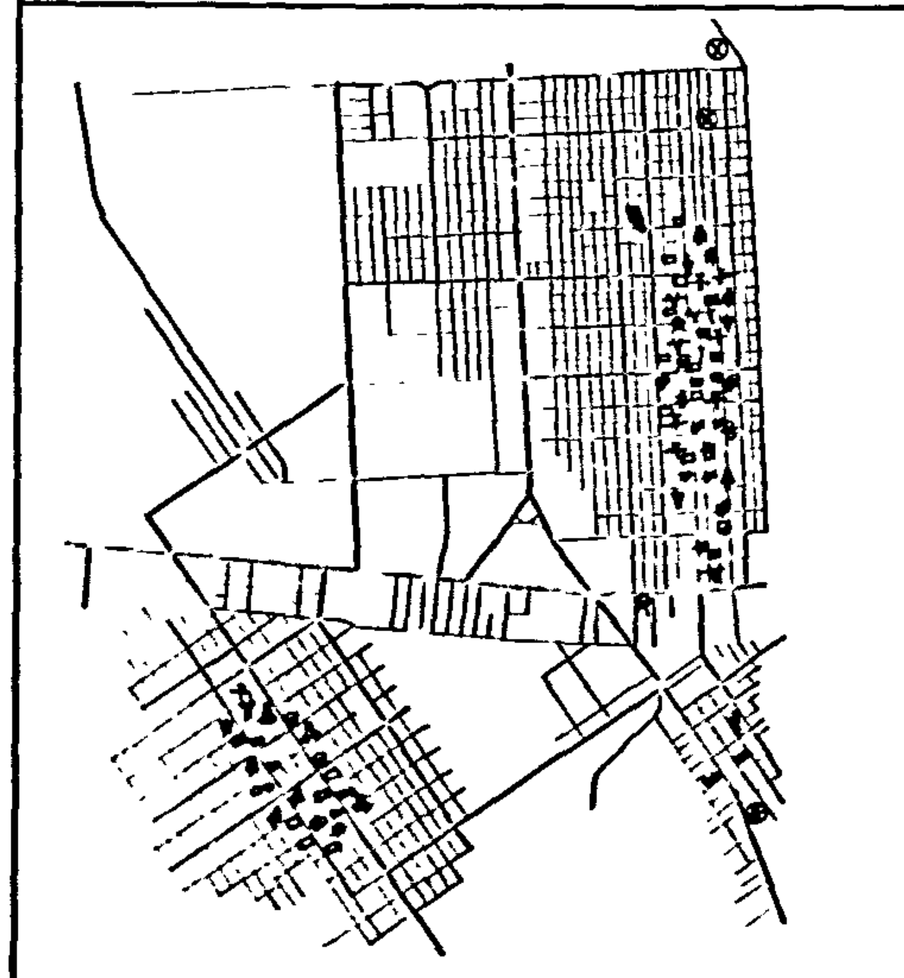
o WHOLESALE FOODSTUFF
● RETAIL FOOD STUFF
⊗ SEEDS MARKET
● GROCERY
● GREENGROCERY
⊕ SHEEP MARKET
● POULTRY SHOP & EGG DEALER
● BAKER
⊗ SUPERMARET



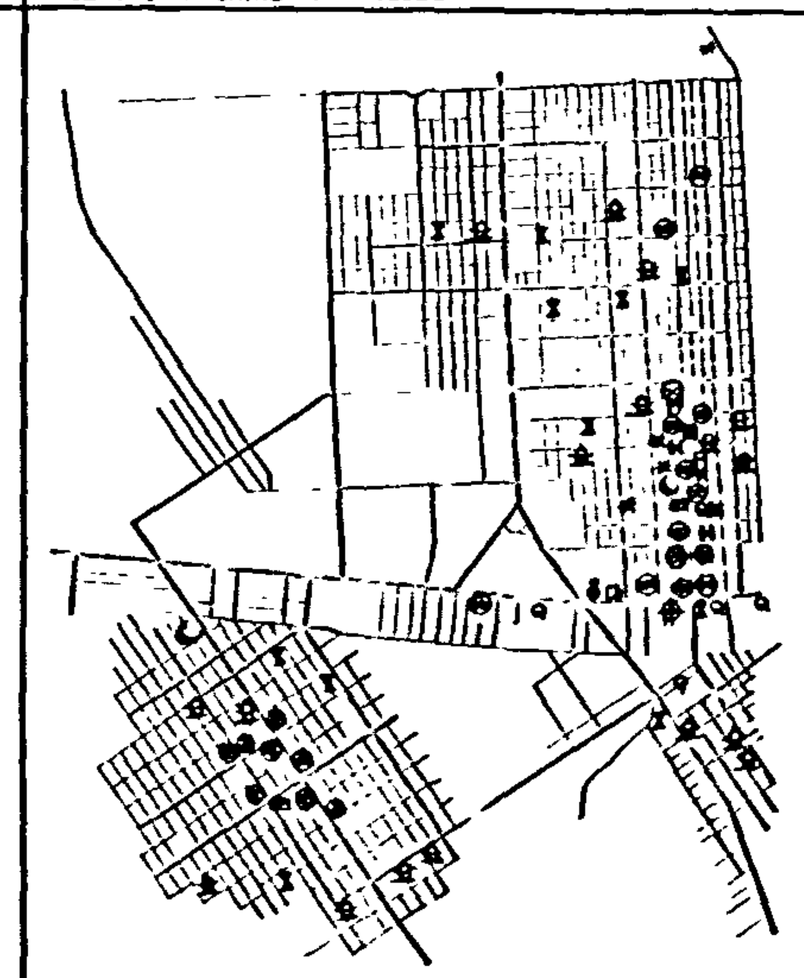
▭ CLOTH.
▭ WOMEN & CHILDREN'S CLOTHES & SHOES.
▭ MEN'S CLOTHES.
▭ TAILORS
✦ KITCHEN WARE.
▲ ELECTRICAL GOODS.
● SEWING MACHINE
● TYPEWRITERS SHOP
§ OFFICE FURNITURE.
O HOUSEHOLD FURNITURE.
▪ CARPETS.
▭ DECORATOR.
✦ COSMETICS & PERFUME.
● JEWELLERY & WATCHES.
● ANTIQUES.
● CHEMIST.
▭ BOOKSHOP.
▲ RECORD SHOP.
▭ MIX CLOTHES.
▭ UBI SHOP.
● WATCH REPAIR



● RESTAURANT
• FAWWAL SHOP
Ƀ SANDWICH SHOP
● COFFE SHOP
▭ PHOTOGRAPHERS
? MEN'S HAIRDRESSER
▭ LAUNDERERS
▭ BUILDING MATERIALS.
▭ SHIP TOOLS SHOP
N GAS DEALER.
y MOTOR SPARES
§ PLANT SHOP
▲ CAR SHOWROOM
H WAREHOUSE



▭ HANDCRAFT
▭ UPHOLSTERER
▭ CAR UPHOLSTERER
▭ CARPENTER
T JOINER
▭ DOOR & WINDOW FRAMES & GLASS SHOP
♦ BLACKSMITH
♦ PRINTING
§ TV/ RADIO REPAIR.
♦ REFRIGERATOR REPAIR
R PUNCTURE REPAIR
▭ GARAGE
● RADIATOR REPAIR
P FOUNDER
▭ CYCLE REPAIR
▲ BRICKS & BLOCKS
Ⓢ SOFT DRINK PLANT
Ⓖ GAS PLANT
● DAIRY



Q GOVERNMENT OFFICE
H BANK
R MONEY CHANGER
⊖ COMPANY OFFICE
⊖ TRAVEL AGENTS
● ESTATE AGENTS
▭ POST OFFICE
● BUSINESS OFFICE
I SCHOOL
H HOSPITAL
H HOTEL
M MOSQUE
● SURGERIES
§ FIRE STATION
⊙ PETROL STATION
✦ TRANSPORT STATION

FIG. 8.77 DISTRIBUTION OF SHOPS WORKSHOPS OFFICES AND SOCIAL SERVICES IN AL-KHOBAR. (1973)

N

0 1000 2000 3000
metres

an average depth of approximately 140 metres, the pressure of water from underground is equivalent to about +4 metres above the surface. Each well has pumping stations with a capacity of between 272 and 400 cu.m.ll. pumping the water to the ground storage tanks which are capable of storing 1040 cu.m. of water.

The new desalination project will supply Al-Khobar with a further 28,400 cu.m. per day which will be added to the existing well water already being pumped through the network.[16] In addition, Al-Khobar's water consumption is reported to be exceeding the estimated consumption for urban residents, of 150 litres per day per person, by a considerable margin. An incentive to consumers to conserve water would be to charge customers using only small amounts a lower unit charge than those consuming larger amounts of water.[17] (See Table 8.68, showing the type of rate per unit charged in Al-Khobar).

TABLE 8.68

TYPE OF RATE PER UNIT CHARGED FOR WATER IN AL-KHOBAR

Cubic Metres of Water	Saudi Riyals
First 30	0.25 per cu.m. per month
30-100	0.50 per cu.m. per month
100+	1.00 per cu.m. per month

Source: Central Planning Organization.

(b) Sewage: By 1973 Al-Khobar's improvements had included the completion of a modern sewage system, the main existing lines discharge directly into the sea on the Arabian Gulf.

(c) Electricity: the electric power station of Al-Khobar has three sub-stations; the station in the east supplies southern and part of northern Al-Khobar; the second station, in the north-west, and the third in the west, jointly supply the remaining parts of Al-Khobar and Al-Thuqbah. The power stations in Al-Khobar are branches of the main power station at Dammam (the Electricity of Dhahran District). In 1973 domestic, commercial, industrial and public utilities use

consumed 9702 units, 30.2% more than in 1967. 76.2% of the consumers were domestic, 19.7% commercial and only 1.0% industrial. 3.0% was used for street lighting, government offices, schools, hospitals, mosques, and other public buildings, and the remaining 0.1% was used for miscellaneous purposes.[18] (See Table 8.69).

TABLE 8.69
NUMBER OF CONSUMERS IN AL-KHOBAR (1973)

Type of Consumer	Number	Percentage
Domestic	7394	76.2
Commercial	1912	19.7
Industrial	100	1.0
Public Utilities	288	3.0
Others	8	0.1
TOTALS	9702	100

Source: Fieldwork, Summer 1973.

(d) Social Facilities

(1) Schools: (See Table 8.70)

(2) Hospitals: Al-Khobar has five hospitals, with 354 beds, four in northern Al-Khobar, the main area of the city, and one between western Al-Khobar and Al-Thuqbah; there is also a health centre in Al-Thuqbah. The largest private hospital is Al-Salamah Hospital located in central Al-Khobar in Nasir Street. The government has only one hospital and one health centre in Al-Khobar, the remainder are private. There are 36 chemists, 30 of them retail, 15 located in the centre of northern Al-Khobar and Al-Thuqbah. In Al-Khobar there are nine private doctors' surgeries, usually open from 9.00 am - 9.00 pm and these are distributed around northern, southern, western Al-Khobar and Al-Thuqah.

(3) Hotels - Al-Khobar has eight hotels of different classes; the most important being the first class luxury hotel which formerly belonged to the Al-Qusaiby family, in the Eastern Province. This hotel is located in the north of Al-Khobar on the coast, and cost about six million Saudi Riyals (£700,000).

TABLE 8.70

DISTRIBUTION OF SCHOOLS AND PUPILS AND CHANGES BETWEEN 1970 and 1972 IN AL-KHOBAR

LEVELS	SCHOOLS								PUPILS							
	1970			1972			Change		1970			1972			Change	
	B	G	T	B	G	T	No.	%	B	G	T	B	G	T	No.	%
Kindergarten	-	3	3*	-	2	2*	1-	33.3	208	237	445	194	170	364	81-	18.2**
Elementary	9	12	21	13	13	26	5+	23.8	4225	3748	7973	3841	4234	8075	102+	1.3
Intermediate	2	2	4	4	3	7	3+	75.0	614	369	983	1132	705	1837	854+	88.9
Secondary	1	-	1	1	1	2	1+	100	308	-	308	361	133	494	186+	60.4
Teacher Training Intermediate	-	1	1	-	1	1	-	-	-	245	245	-	157	157	80-	32.7‡
Secondary	-	1	1	-	1	1	-	-	-	12	12	-	69	69	57+	475.0
Evening Class	1	-	1	1	-	1	-	-	234	-	234	367	-	367	133	56.8
TOTALS	13	19	32	19	21	40	8	25.0	5589	4611	10200	5895	5468	11363	1163+	11.4

* Mixed schools, boys and girls (private)

** Some of the private schools in the Province were dwindling gradually during the past few years because their target was more to make money than to educate and care for the children.

‡ The teacher training schools for intermediate level were being closed down, and pupils transferred to the secondary level in the new education plan. Pupils will still be taught at intermediate level

Source: Ministry of Education and the Presidency of Girls Education

The function of Al-Khobar as the business centre and the city where businessmen prefer to establish their businesses has created a demand for such first class hotels, as well as others.[19]

4. Banks - Al-Khobar has eleven banks, ten of which are found in the centre of the northern Al-Khobar; two in Khalid Street (the main street of the city), one in Nasir Street, two in Saud Street, three in Street No.1, and two in Street No. 3, where these streets cross the main street. In addition, there are seven money-changers in the centre of Al-Khobar, and eleven located in Khalid Street.[20]

5. Religion - Unlike other cities in the Eastern Province, Al-Khobar has a large number of non-Muslim residents of mixed nationalities, and many Europeans, Americans, Asians and Japanese came to Al-Khobar to work with different firms, who account for about 7.1% of the population. (See Table 8.71).

TABLE 8.71
RELIGION AND BELIEFS: NUMBER IN AL-KHOBAR (1973)

Religion and Beliefs	Number	%
Hanbali	555	34.4
Shafiai	315	19.5
Maliki	250	15.5
Hanafi	220	13.6
Shi'iah	130	8.0
Non Muslim	115	7.1
Unknown	30	1.9
TOTALS	1615	100

Source: Fieldwork

There are 47 mosques in Al-Khobar, and the main Friday mosque is situated in Saud Street in the city centre. About eleven mosques are Friday mosques, and the others are non-Friday mosques.

Al-Khobar has two cemeteries, the oldest located between northern and southern Al-Khobar near Dhahran Road.

6. Transport Stations - in Al-Khobar there is no particular transport station, but there are stopping points for taxis and other vehicles.

In Dhahran Road, at the junction with Khalid Street, there are two stops, one private for company buses and the other is for taxis travelling to Hofuf, Abqaiq and Kuwait. None of these stops is official. For taxis travelling in other directions (e.g. Dammam), there are no particular stop points, but often taxis stop at the end of Khalid Street, and many cruise around the city looking for passengers.

7. Parks and Recreational Areas - there are about five parks in Al-Khobar, two in northern Al-Khobar near the city centre and on the coastal road to Dammam; two on Dhahran Road between northern and southern Al-Khobar, and the fifth in the centre of Al-Thuqbah. There is a new plan for more parks on the coast road to the pier of Al-Khobar in the north of Al-Thuqbah, near the main road to Dhahran, and another in northern Al-Khobar.

Al Khobar is essentially a new city designed in the first place to house oil company employees, secondly to supply this population with services through retail trade and thirdly to house and supply the population engaged in these services; it has also become a shopping centre serving the whole Midland region. Manufacturing industry is poorly represented. Al Khobar has grown around two nucleii, the most important the harbour area of Al Khobar proper, the secondary centre being Al Thuqbah. A comparison of its functions with these of the other case-study settlements is made at the end of this chapter.

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19. Ibid
20. Ibid

E. DHAHRAN

In the Eastern Province there are three settlements which can be called 'oil towns' - Dhahran, Abqaiq and Ras Tannura. All three have some similar functions in that all provide residential and some administrative facilities for Aramco operations.

The three oil towns also have similarities in their industrial areas, health centres, recreational buildings and other social facilities. Dhahran is outstanding as it has been the headquarters of the oil company (Aramco) from which all the oil operations in the Eastern Province are directed.

The three towns of Dhahran, Abqaiq and Ras Tannura each have a power station, and each station, using natural gas, is interlinked and is capable of supporting the others should one of them fail. The differences between the three towns are partly historical: Dhahran was the site of the first oil production; Ras Tannura has been developed on the coast as a refinery centre and as the main oil port (partly administrative); Abqaiq is now the most important oil production site, but the decision was made to maintain the central headquarters of Aramco in Dhahran, and this has made Dhahran the largest and most diverse of the three urban centres, and for this reason, it has been chosen for this sample study.

General location and Site and Early Development

Until recently the site of Dhahran was a vast expanse of sand and naked rock. The only striking surface feature is Jabal Dhahran from which the name of the town is taken, and some hills, one of which is now the site of the new Petroleum College.

The port of Jubail, about 90 Km to the north of Dhahran was Aramco's first headquarters for its geologists when they came from Bahrain at the start of the search for oil,[1] and from here the company directed its research operations. When geologists arrived on 28 September 1933, they drove 90 Km to the south, away from the coastal region, to a hilly area

they had observed from Bahrain, and there they set up their first tent camp. The hilly area was Jabal Dhahran (Dammam Dome) the most prominent hill in the area[2] surrounded by the 'Barr-adh-Dhahran (which) contains numerous small clumps of date trees scattered about in all directions'.[3]

The small coastal harbours of Jubail and Uqair were unattractive to the first oil-field crews. Water as noted below was nowhere easily obtainable in large quantities and the slight eminence on which the first camp was sited offered at least some fresh breezes during periods when the coastal climate is still and humid. An additional factor commonly found in early oil operations is a need felt for physical separation of an oil camp away from existing traditional dwellings for reasons of health and security. In all, the site of the first successful oil find was no less attractive than any other site for habitation, and oil-field operations were more important as locational considerations than the very poor port facilities (which were regarded only as having temporary value) at Jubail. Once Dhahran, became the oil field operational centre of a foreign company in an alien land, the decision was taken to build up all other ARAMCO central activities on the same site until a point was reached at which any transfer to another place would have involved major additional expenditure and the leaving of a site given to the Company by King Abdul Aziz.

Dhahran was therefore faced with the problem of supplying living quarters for the oil men, along with food and water - none of which were plentiful at that time. The oil men had come from the USA equipped with some food and water, and also pipes, transport and spare parts for their machinery.[4] The main difficulty was finding drinking water, and some was obtained from a hand-dug well in the flat area below the Jabal. Dhahran yielded some sweet drinking water of a fair quality,[5] and water for other camp purposes and for drilling could be obtained from sea water springs exposed at low tide between Dammam and

Al-Khobar, although this water was slightly brackish.[6] The main problem here was transporting water from the springs to the camp. These springs were later walled in with concrete, and a pump was installed and a small pipeline, about eleven miles long was laid to the camp; these facilities were practically complete by the time Dammam No.1 was spudded in at the beginning of 1935,[7] and the camp in Dhahran area had more home comforts than Jubail.

Population and its Growth

The small community which grew up in the areas surrounding Dammam Dome after the discovery of oil was made up of the American oil employees, most of whom were bachelors, and their Saudi Arabian workforce.[8] In 1937 their number was 53, and by 1939 it had increased to 200 Americans alone; by 1940 when the families of the oil men arrived, the numbers had increased to 425.[9] With the outbreak of the Second World War, the number of Americans was considerably reduced, and in 1942 only 100 were left, but when the war ended a steady increase in operations caused the numbers of both American and Saudi employees to increase gradually. Statistics for 1952 indicate a rise in numbers of employees resident in Dhahran, and a corresponding rise probably occurred in the towns surrounding area. 1952 was the peak of Aramco direct employment and thereafter the population of Dhahran slowly decreased.

As has been previously explained, Dhahran's sole importance was as an oil town, and the aim in developing it was to make life easier for the oil employees and their families. In 1954 and 1959 Aramco carried out surveys on the company population in the three oil towns of Dhahran, Ras Tannura and Abqaiq, and the results for Dhahran showed that in the five years between 1954 and 1959 the company population fell from 12,444 to 9.416, a drop of about 24% This consus did not include people not employed by the company, nor dependents of

such people (eg local and government agents, policemen, clerks of Dhahran court and the owners of several retail shops). Dhahran had the largest population of the three oil towns of the Eastern Province as shown by the following tables (Tables 8.72 and 8.73 showing the population in the three towns in 1954 and 1959).[10]

TABLE 8.72
POPULATION OF THE THREE OIL TOWNS 1954

Town	No. of Employees	No. of Family Residents	Total
Dhahran	10,544	1,900	12,444
Ras Tannura	5,882	761	6,643
Abqaiq	5,721	928	6.649

Source: Aramco.

TABLE 8.73
POPULATION OF THE THREE OIL TOWNS 1959

Town	No. of Employees without Families	No. of Employees with Families	Total
Dhahran	7,407	2,009	9,416
Ras Tannura	4,517	1,004	5,521
Abqaiq	4,443	901	5,344

Source: Aramco.

These two tables include the bachelor employees of the company living in dormitories, who were almost all Saudi Arabian, and who far outnumbered the American and other foreign employees living with their families in the senior staff quarters at Dhahran.

The 'non-company' population numbers and trends have not been directly measured in Dhahran, although indirect evidence, ie housing and the re-allocation of buildings, shows that the estimated numbers of between 100 and 200 have remained roughly constant, or may have fallen slightly. The eastern third of the Salama residential area, for example, has been allocated by Aramco to seasonal student residents and staff accommodation associated with the Petroleum College.

Growth in Dhahran

The first oil camp established in Dhahran in 1935 (See Fig. 8.72, photo 1935) was more orderly than the usual haphazard oil camp. At first the main constructions were the drilling equipment for research, and a dormitory camp which had no air conditioning, as Dhahran then had no electrical supply. In the early stages, only local materials were used in construction. By 1937, the number of employees living in Dhahran had risen to 53, and the first influx of wives and children had arrived; the first small community was established, and soon the nucleus of the town was formed with ten air-conditioned cottages, situated at the west of Eleventh Street.[11] (See Fig. 8.73, photo 1938).

A temporary hostel and clinic were set up in three family cottages and by 1938 when oil was discovered in commercial quantities, the first real expansion of Dhahran's residential and industrial areas began. Expasnion included the founding of a commissary, store house, garage, laundry, repair shops, utility, plant power and air conditioning plant, and these facilities helped to make Dhahran a self-contained community.[12] Moves were initiated to increase Aramco staff and increasing numbers of both Saudi and American personnel were recruited in 1940 as oil explorations were stepped up in Eastern Province. Further expansion included increasing the dormitory accommodation for single men and building more cottages for married men to bring their families, making a total of 95 cottages, as well as provision of a dining hall.[13] (See Fig. 8.74, photo 1943).

Dhahran after the War

The outbreak of the Second World War halted the search for oil and consequently affected Dhahran's growth. By the end of 1940 the numbers of foreign employees had been reduced by about 39%; the last women and children were evacuated from Dhahran in May 1941, and by the

FIG.8.72 . THE FIRST DHAHRAN CAMP OF ARAMCO IN 1935.

FIG.8.73. DHAHRAN CAMP OF ARAMCO IN 1938.

FIG.8.74. DHAHRAN IN 1943.

middle of 1942 only 100 were left. About 39% of the 3300 Arab and non-Arab work force were made redundant as the oil camps were closed down.[14] By the end of 1944, operations began again, the numbers of workers quickly grew and communications were back to normal.[15]

Development and Planning

From 1944 to 1950 Dhahran continued to grow rapidly and the number of employees increased accordingly from 3671 in 1940 to 24,838 in 1952.[16] Housing construction was speeded up and in 1953 the temporary huts and tents were replaced by permanent dormitories, and extra recreational facilities were provided, which included swimming pools. One of the most important steps in this period was Aramco's division in 1951 of its permanent staff into categories (senior, intermediate and general), and its allocation of company housing by position in the company.[17] (See also p.365) This new classification determined the eligibility of staff for housing and other facilities. (See Fig. 8.75, photo 1951). In 1952 the camp for intermediate employees was completed in Dhahran and additional housing, particularly family housing, was completed in the senior staff communities. In spite of the extensive building programme, by 1952 the number of employees had increased so rapidly that it was difficult for them to acquire company housing.[18]

Increasing expansion and development of the oil industry in the Eastern Province encouraged the company in 1953, to move their general office from New York City to Dhahran in order to be at the hub of the vastly enlarged industry.[19] The growth of the oil industry in the Province had been accompanied by corresponding expansion in Dhahran, which by 1953 had seen many improvements. By the end of 1953 the new two-storey health centre offering in-patient and out-patient services was complete; made of cement, brick, steel, tiles and glass, it was air-conditioned throughout, with special communications systems and an independent power system for use in emergencies. By 1957 the capacity of Dhahran Health Centre had increased to 220-266 beds; the total cost

FIG.8.75. DHAHRAN IN 1951.

of all three wings was approximately SR.28,500,000 (£2,850,000).[20] Dhahran also received an advanced industrial training centre completed in 1954.[21]

Also in 1954, the streets were improved at the general employees' camp at Dhahran, and the part in front of the main mosque in Dhahran was landscaped. Trees and shrubs were planted and benches and gravel walkways were built; even the rooms of the intermediate and general employees were provided with kerosene heaters and kerosene refuelling stations were installed at convenient locations near the dormitories.[22]

At the end of 1955 work commenced on a new three-storey administration building in Dhahran, adjacent to and north of the old administration building on the main road connecting Dammam, Dhahran and Al-Khobar. The old and new administration buildings were connected in an attempt to concentrate all the offices in one area. The new centre cost approximately SR.19,875,000 (£1,987,500), and in the same year work commenced on a new communications building which, including telephone lines, cost SR.2,643,750 (£264,375). The third large building constructed at that time was the new warehouse, built at a cost of SR.1,987,500 (£198,750) to serve as a central storehouse for dried foods.[23] Early in 1956, the new Dhahran consolidated workshop was opened; built at a cost of SR.6,400,000, this facility brought all fifteen small workshops together under one roof,[24] and occupied an area of approximately 5017 sq.m.

The expansion of the residential site (both houses and dormitories) was accompanied by a corresponding rise in the number of employees of all grades. Dhahran's residential site grew in stages; 1933-40 it became established as a temporary site; 1940-44 growth halted as a result of the Second World War. In the post-war years to 1950 growth was rapid but between 1950-60 expansion was at an extremely rapid pace (See Fig. 8.76, photo 1960). By then the facilities were found to be sufficient for the small oil town, for the following reasons.

FIG. 8.76 DHAHRAN IN 1960.

1. The number of employees was reducing each year, due to improved mechanisation (See Table 8.74 showing the reduction over selected years). From verbal statements made by company representatives one gathers that this reduction affected expatriate and Saudi Arabian employees in the same proportion (See also p. 366).

2. Most of the Saudi Arabian employees preferred to purchase their own homes via the home ownership programme, either in Dammam or Al-Khobar and many employees formerly living in bachelor quarters in Dhahran had now bought houses in Al-Khobar and Dammam. The employees' dormitories in Salamah quarter are at present occupied by students of the Petroleum College. (See Fig. 8.77, photo 1970).

TABLE 8.74
NUMBER OF ARAMCO EMPLOYEES (1952-72)

Year	Number of Employees
1952	24,838
1956	19,632
1959	16,257
1963	12,988
1966	12,664
1970	10,353
1971	10,107
1972	11,282

Source: Aramco

The New Plan

The new plan for Dhahran divided the town into four parts:

1. the three quarters, Monirah in the north, Salamah in the north-east, and senior staff (Dhahran quarters) in the south.

2. The administrative buildings and Dhahran Health Centre are situated in the middle of the three quarters.

3. The industrial zone and warehouses are in the west of Dhahran town, and via the railroad to Dammam.

4. The Petroleum University town site is to the east, on the main road from Dammam to Al-Khobar.

In Dhahran's early stages of development after the discovery

FIG.8.77. DHAHRAN IN 1970.

of oil, the residential site was never intended as permanent. The small number of metal and wood huts were grouped near to the oil operations, and the first recognisable dwellings were the ten air-conditioned cottages of the senior staff quarter, built in 1936. The increased drilling brought a corresponding need for a more permanent residential site and in the 1940's Aramco drew up plans for a properly laid-out residential site, with blocks and streets. Streets were in two widths - 10 and 20m., and blocks were of varying sizes as follows:

1. Small (from 50m x 60m to 50m x 40m)
2. Medium (from 115m x 120m to 70m x 50m)
3. Large (from 180m x 190m to 70m x 120m)[25]

The smaller blocks consisted mainly of bachelor dormitories and the medium blocks for groups of houses. Plans were laid out in grid-iron blocks at the Monirah and Salamah quarters, oriented to the south-west; but the grid-iron plan at the Monirah quarter differs in the southern part, as it was oriented to the north-west, parallel to the main Dammam-Al-Khobar road. In general, the grid plans in these two quarters followed the curves of the main road (Dammam and Al-Khobar, via Dhahran), which zig-zags through Dhahran between the two quarters in the north and the senior staff quarters in the south.

The section south contains the administrative quarter and industrial zone; the plan in this area, particularly for residential areas, differs from other quarters. It is laid out in a gridded circular pattern with grid curve plans with distribution areas for parking and recreation. Some similarity can be observed between the Monirah and Salamah quarters, as both have 10m wide streets, crossing at right angles. The senior staff quarter bears a remarkable resemblance to any small American town - the recreational areas are situated in the centre of the southern side; the school is on the eastern side; the dining hall in the north-west; the administration block, shopping centre and other facilities, along with the health centre (south building) are found on the northern side of the senior staff quarters.

Planned Area of Residential Expansion (Fig.8.76)

Area A to the south-west of the senior staff quarters was the first area to be developed, with planned streets, tennis courts, a swimming pool and other recreational areas in its centre. The real housing expansion began in 1945 after the Second World War, when Aramco expanded its oil operations. The company planned Dhahran for this second expansion, in particular the residential area of its senior employees, most of whom were of American nationality. The plan was similar to that of a small American town, in the type of streets and design of houses; it covered only Areas A and B, and the other areas were planned in a grid-iron plan and left vacant. Expansion in Area A was to the east, north, west and south-west of the oldest housing groups; houses in this area were compactly built in high density single-storey blocks. Area B was expanded in the second stage, and its built-up area extended to the north, east and south, and this provided more homes for the American employees of the oil company and their families.

The third stage of the second expansion was partly in Areas C D and E, outside the zone of the American families' homes (senior staff quarters). The expansion was to the north of Dhahran, and provided housing in groups of medium density rooms for the Saudi bachelors, classed as general oil employees. The third expansion took place in the period between 1951-60, mainly in Area D and partly in Area C, for the general oil employees and also partly to the east of Area B within the senior staff quarters. The administrative building and the Aramco Health Centre in the senior staff area were also expanded as Aramco's business increased. Areas F and G were expanded in the more recent fourth stage expansion between 1960 and 1970, and included Dhahran Airport and the expansion of the new Petroleum College town site to the east of Dhahran quarter (senior

FIG.8.78 THE RESIDENTIAL EXPANSION IN DHAHRAN 1934 - 1970.

A OLD CAMP AND THE FIRST EXTENSION.

B SECOND, THIRD, AND FOURTH EXT.

C SECOND AND THIRD EXT.

D THIRD AND FOURTH EXT.

X INDUSTRIAL ZONE IN A SECOND EXT.

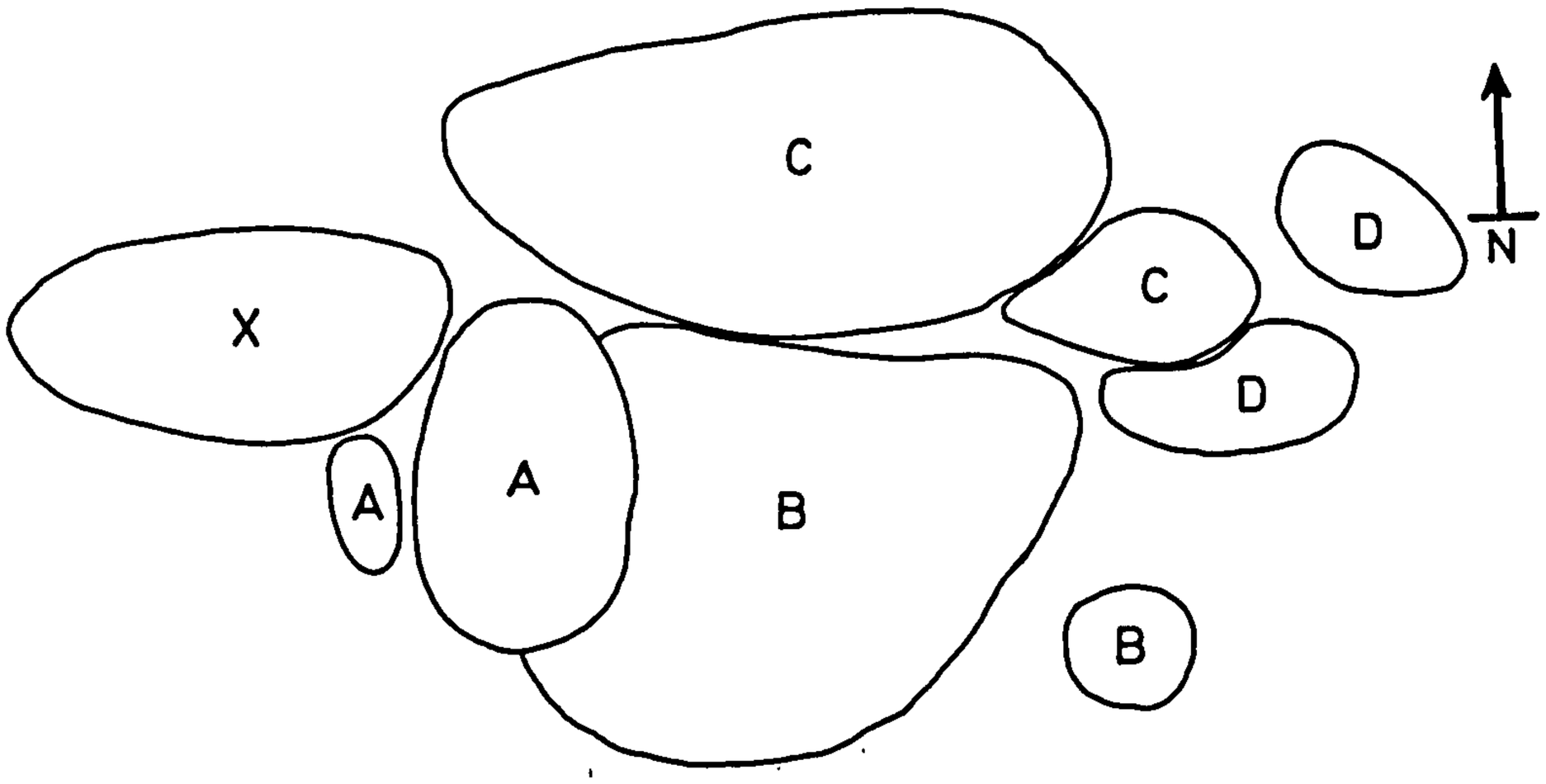


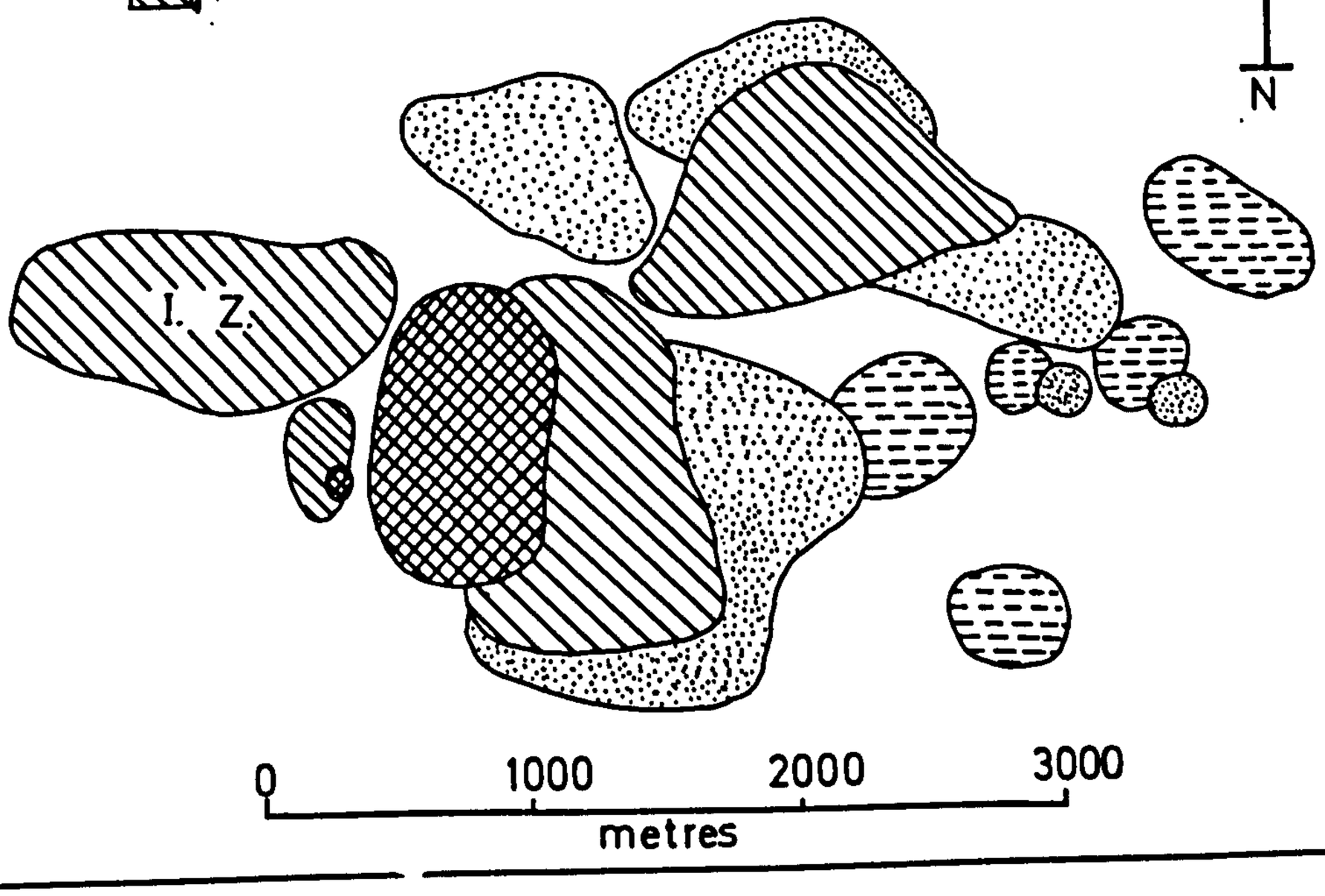
FIG.8.79 THE SEQUENCE OF THE GROWTH IN DHAHRAN 1934 - 1970.

OLD CAMP 1934 - 1943.

1943 - 1951.

1951 - 1960.

1960 - 1970.



staff), outside the oil company's areas and further expansion within the company's areas to the north-east of the senior staff areas.

The Sequence of Growth (See Fig. 8.79)

When the first American families arrived in Dhahran and homes and recreational facilities were provided for them in the middle of Area A. Growth in Dhahran increased rapidly between the end of the Second World War and 1951, initially in Area A and later in Areas B, C and E, and included the residential units, offices and public utilities. (See Fig. 8.80, maps of 1943 and 1951). This spurt in the rate of expansion followed careful planning by the company, and slowed down between 1951-60 when the demand for houses waned slightly.

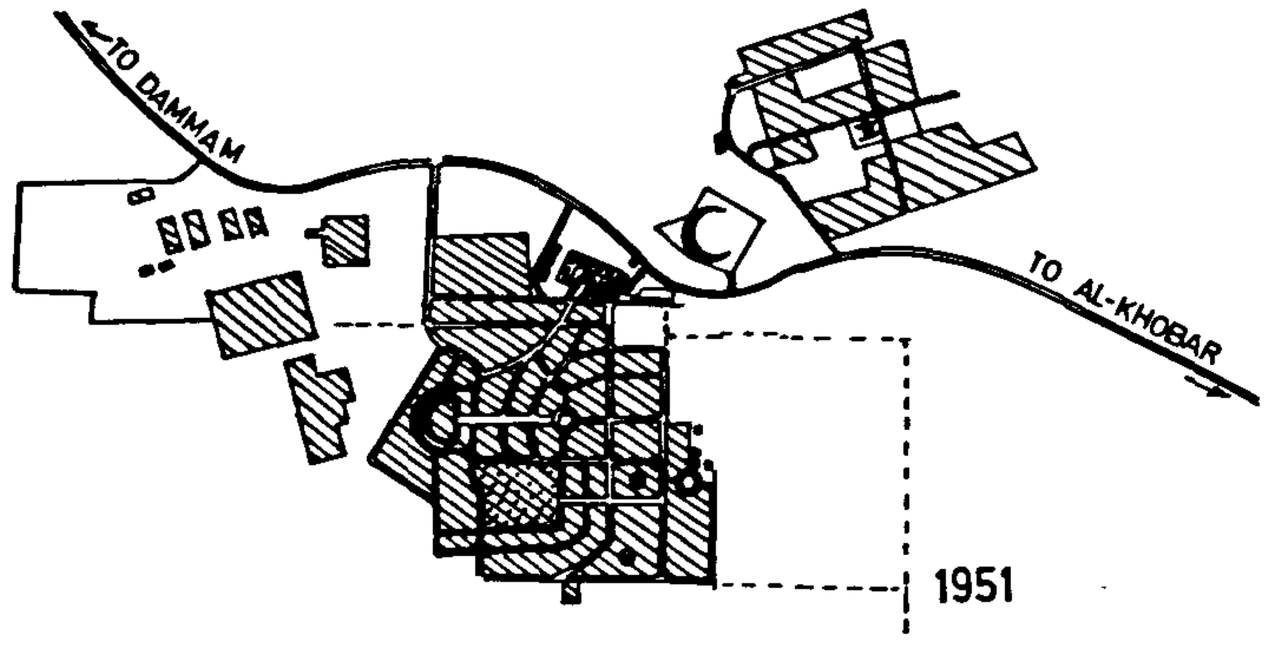
The decline in the number of employees together with the choice by many Saudi Arabian workers to live elsewhere had different results for different parts of Dhahran. The senior staff housing area (See Fig. 8.78 areas A and B) merely had a lower occupancy rate. Monirah and Salamah quarters on the other hand were not built to the original plan capacity so that as can be seen from Fig. 8.77 some blocks were not constructed; in addition Salamah housing was given by Aramco for student accommodation after the establishment of the Petroleum College (now a University) in 1964.

Dhahran is essentially an oil town, and local people not employed by the oil company prefer to live elsewhere. Growth during the period 1960-70 was similar to that prior to 1960, with very little expansion of the residential areas, but the construction of the airport and the Petroleum University town site near to the Aramco administration and residential areas. (See Fig. 8.81, maps of 1960 and 1970).

Housing

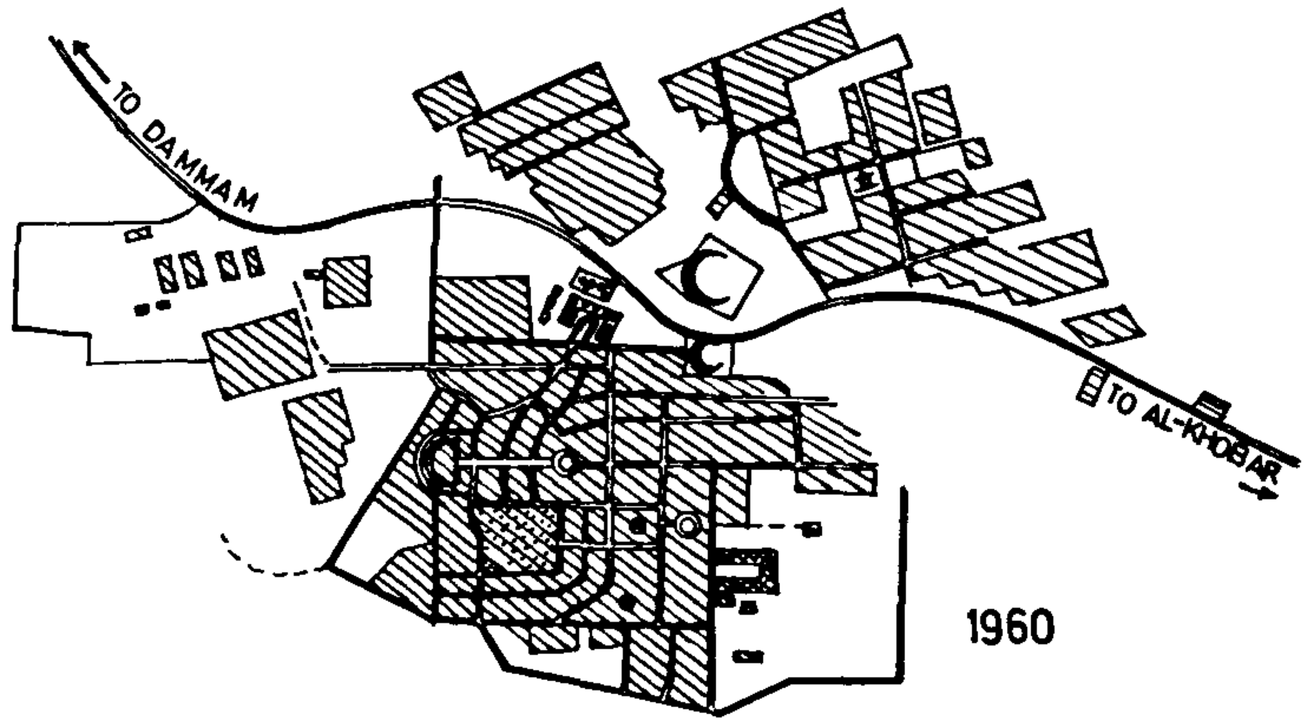
Saudi Arabian employees were provided with housing in company communities, but these communities have no family housing except for the senior staff quarters. Bachelor employees, who are generally in the intermediate and general classes of employment, are given transport to and from their homes at weekends, and are given an opportunity to buy homes through the Aramco home ownership plan, in Al-Khobar and Dammam. Employees from more distant places could normally return

1943

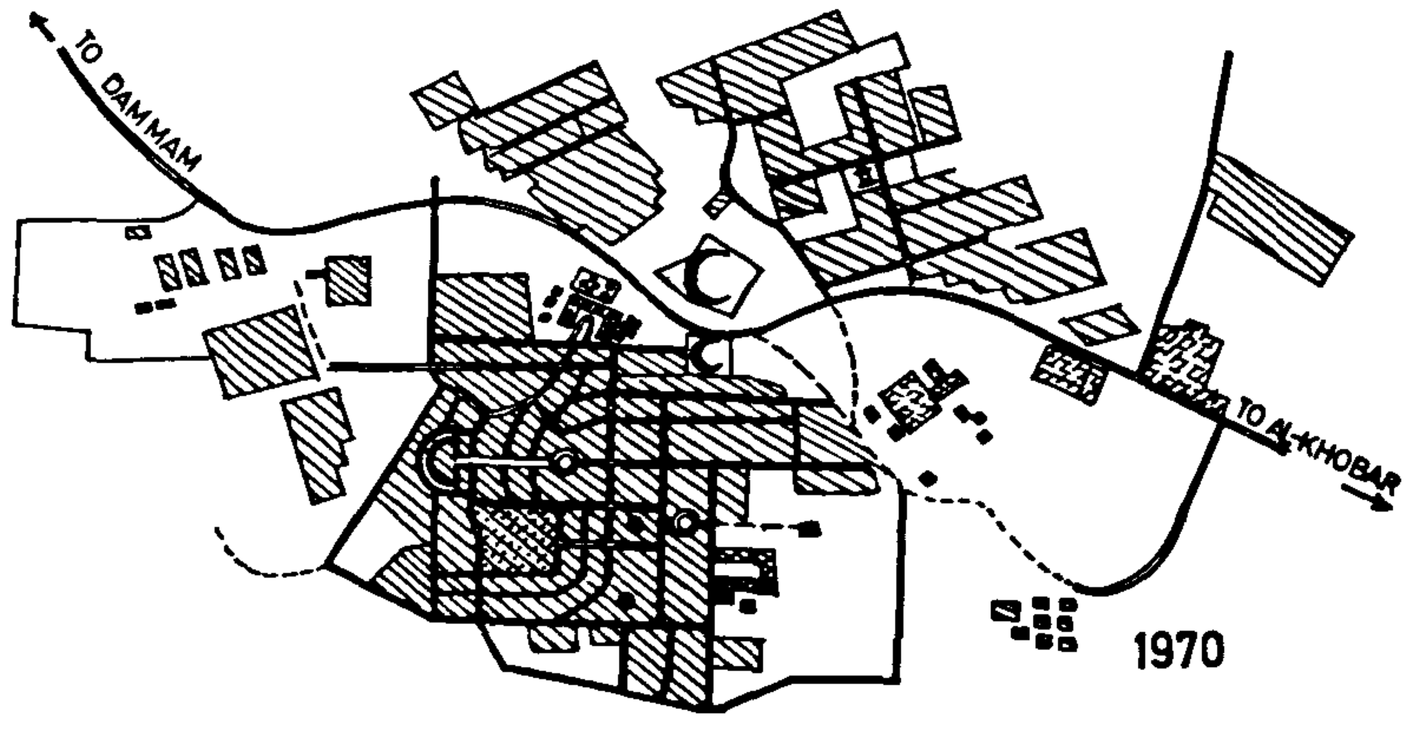


1951

FIG.8.80 DHAHRAN EXPANSION IN 1943 & 1951.



1960



1970

FIG.8.81 DHAHRAN EXPANSION IN 1960 &1970.

1000 500 0 1000 2000

metres

N

RESIDENTIAL AREA

SCHOOL

ADMINISTRATION

PETROLEUM UNIVERSITY

MOSQUE.

HOSPITAL.

RECREATION AREA.

9-72 A. M. AL-SHUAIBY.

home only during vacations, and could only get family living quarters if they were senior staff. The allocation of housing for foreign employees in either Ras Tannura or Abqaiq fell into three categories:

1. Americans were provided with housing in Aramco communities in the three largest oil towns, of a type and standard familiar to them at home; this move was intended to make them feel more settled; these houses were simply constructed in the shortest possible time. (See Fig.8.82 and 8.83, photo and plates).

2. Housing in the second category was for the bachelor Saudi Arabian employees, who were recruited largely from towns in the surrounding areas, and where they returned every weekend.

3. The third type of accommodation was for other nationalities, and some Saudi Arabian employees recruited for skilled jobs, and who qualified for family housing in the senior staff quarters.

Aramco's 1951 division of employees regardless of nationality

determined an employee's eligibility for housing and other facilities, but family housing came in a variety of sizes and types. The houses in Dhahran's family living quarters were one-storey cottages or bungalows, with a small front garden fenced in with shrubs; the area surrounding each house was planted with grass and each house had between two and four bedrooms, a dining room, a sitting room, kitchen and bathroom. The bachelor dormitories were one storey 'U' shaped buildings each with 12 rooms, and a garden area in the centre of the U.

Streets

The family living quarters (senior staff) were designed with straight wide modern two-way streets which, unlike those in the general employees' quarters were not set at right angles. Streets in this area were asphalted, with footpaths, lighting and green areas in the centre. (See Streets, Chapter 8, Introduction).

FIG. 8 .82. DHAHRAN QUARTER (SENIOR STAFF) MAIN ARAMCO ADMINISTRATION ON THE TOP RIGHT.

Headquarters of the Oil Company.

Type of housing at Dhahran Quarter (Senior Staff).

Type of street at Dhahran Quarter.

FIG.8.83. THE RESIDENCE OF THE AMERICAN EMPLOYEES.

Commercial Activities

Dhahran is the oil town and headquarters of the oil company, but it has not become a commercial centre, since most of its residents are oil employees, with a few government agents and students of the Petroleum University. In 1967 Dhahran had only 115 commercial and industrial establishments, and by 1971 this number had dropped to 110. (See Table 8.75).

TABLE 8.75
ESTABLISHMENTS IN DHAHRAN IN 1967 AND 1971

	1967	1971	Decrease	% Decrease
Number of Firms	115	110	5	4.4
Workers	1144	1140	4	0.4
Average No. of workers per firm	9.9	10.7	0.8	

Source: Ministry of Finance, Central Department of Statistics

Dhahran had 81 commercial establishments (73.6% of the total) 15 industrial and 14 transport and storage establishments (See Table 8.76).

TABLE 8.76
SIZE AND TYPE OF COMMERCIAL, INDUSTRIAL AND TRANSPORT AND STORAGE FIRMS IN DHAHRAN (1971)

	No.	%	Employees	%	Average No. of Workers/Firm
Commercial	81	73.6	916	80.4	11.3
Industrial	15	13.6	45	3.9	3.0
Transport & Storage	14	12.8	179	15.7	12.8
TOTALS	110	100	1140	100	10.4

Source: Ministry of Finance, Central Department of Statistics

The commercial establishments in Dhahran are independent, small private businesses, owned by local inhabitants, mainly small retailers of miscellaneous goods or with general shops for daily needs. Next largest are the service industries, which include housing and personal services; Dhahran has only one hotel situated near Dhahran Airport (Dhahran Airport Hotel), and a few small restaurants. There are very few building firms, and only one small builder's shop. (See Table 8.77).

TABLE 8.77
DISTRIBUTION OF COMMERCIAL ESTABLISHMENTS IN DHAHRAN (1971)

	No.	%	Independent Establish-ments	Headquarter Establish-ments	Branch Establish-ments
Retail	58	71.6	53	1	4
Restaurants & Hotels	8	9.9	6	-	2
Construction	1	1.2	-	-	1
Services	14	17.3	13	-	1
TOTALS	81	100	72	1	8

Source: Ministry of Finance, Central Department of Statistics

All commercial establishments are located outside the senior staff zone on the other side of Dhahran, in the area inhabited by local people. Three major factors have influenced commercial activities in Dhahran:

1. The function of Dhahran as the headquarters of the oil company.
2. Its close proximity to Al-Khobar (10Km)
3. The oil employees (particularly those who live in Dhahran senior staff quarter) who travel to Al-Khobar almost daily to take advantage of the wider variety of goods and services available. Also, the private supermarket in the senior staff quarter is available for all employees and their families in this quarter.

The classification of commercial establishments by number of employees shows that 65.4% have only one employee, 28.5% have between two and four, 3.7% have between five and nine and the remainder have between 50 and over 100 employees. (See Table 8.78).

TABLE 8.78
CLASSIFICATION OF COMMERCIAL ESTABLISHMENTS BY NUMBER OF EMPLOYEES (1971)

	1	2-4	5-9	10-19	20-49	50-99	100+	Total
Retail	39	16	3	-	-	-	-	58
Restaurants & Hotels	4	3	-	-	-	1	-	8
Construction	-	-	-	-	-	-	1	1
Services	10	4	-	-	-	-	-	14
TOTALS	53	23	3	-	-	1	1	81
Percentages	65.4	28.5	3.7	-	-	1.2	1.2	100

Source: Ministry of Finance, Central Department of Statistics

In Dhahran's commercial establishments, 9.1% of the work force is unpaid, and 90.9% were wage paid workers (See Table 8.79).

TABLE 8.79
PAID AND UNPAID WORKERS IN COMMERCIAL ESTABLISHMENTS (1971)

	Unpaid	Paid	Total
Retail	66	34	100
Restaurants & Hotels	5	58	63
Construction	-	730	730
Services	12	11	23
TOTALS	83	833	916
Percentage	9.1	90.9	100

Source: Ministry of Finance, Central Department of Statistics

Industrial Activities

As Dhahran has been mainly an administrative town for the oil company the number of non-oil industries is very small. There is a small sub-station supplying electricity to local people, and the Aramco quarters are supplied by the company power station. The total number of industrial establishments in 1971 was 29, including transport and storage. Clothing manufacturers occupied first place among industrial establishments (34.5%) followed by soft drinks and ice (10.3%). (See Table 8.80)

TABLE 8.80
DISTRIBUTION OF INDUSTRIAL FIRMS AND TRANSPORT AND STORAGE (1971)

	No.	%	Independent Establishments	Headquarter Establishments	Branch Establishments
Soft Drinks and Ice	3	10.3	3	-	-
Clothing Manufacturers	10	34.5	10	-	-
Carpentry	1	3.5	1	-	-
Electricity	1	3.5	-	-	1
Transport & Storage	14	48.3	7	1	6
TOTALS	29	100	21	1	7

Source: Ministry of Finance, Central Department of Statistics

The classification of industrial establishments by number of workers indicates that about 44.8% have only one employee, 24.1% have

between two and four employees, 6.9% have between five and nine, 13.8% have between 10 and 19, and the remaining 10.4% have between 20 and over one hundred employees. (See Table 8.81)

TABLE 8.81
CLASSIFICATION OF INDUSTRIAL AND TRANSPORT AND STORAGE ESTABLISHMENTS IN DHAHRAN (1971)

	1	2-4	5-9	10-19	20-49	50-99	100+	Total
Soft Drinks & Ice	2	-	1	-	-	-	-	3
Clothing	8	2	-	-	-	-	-	10
Carpentry	1	-	-	-	-	-	-	1
Electricity	-	-	-	-	1	-	-	1
Transport & Storage	2	5	1	4	1	1	-	14
TOTALS	13	7	2	4	2	1	-	29
Percentage	44.8	24.1	6.9	13.8	6.9	3.5	-	100

Source: Ministry of Finance, Central Department of Statistics

94.2% of the workers in these industrial firms in 1971 were paid, and the remainder were unpaid workers (See Table 8.82)

TABLE 8.82
PAID AND UNPAID WORKERS IN INDUSTRIAL FIRMS AND TRANSPORT AND STORAGE (1971)

	Unpaid	Paid	Total
Soft Drinks & Ice	2	5	7
Clothing	10	2	12
Carpentry	1	-	1
Electricity	-	25	25
Transport & Agents	-	179	179
TOTALS	13	211	224
Percentage	5.8	94.2	100

Source: Ministry of Finance, Central Department of Statistics

Distribution of Special Functions

1. Administration Headquarters: the headquarters of the oil company in Dhahran occupies the two largest buildings in Dhahran. The first (south building) was built pre-1950 and consists of a one-storey building constructed in 1935 for the administration of the early drillings at Dammam Dome No.1. When this building was abandoned

as an office, it was used in the construction of homes, and the administration office was moved to a vast 'U'-shaped two-storey building, with rows of windows and four tall porticos at the main entrance, and with several smaller buildings (huts etc) alongside.

Expansion of its business by 1957 caused Aramco to build another large building to the north. Square in shape, the new three storey structure had long rows of broad glass windows, and was linked with the existing office block. From these buildings all Aramco's Saudi Arabian oil operations are directed, mainly construction, exploration, medical services, production, distribution and government relations. There are also accounting, community services, engineering, mechanical services, utilities and industrial relations departments, along with material supplies and traffic.[28]

The administrative headquarters in Dhahran deals mainly with overall policy, planning and co-ordination, and is responsible for all oil operations in the three main districts of Dhahran, Ras Tannura and Abqaiq. As a result, Dhahran was linked by modern transport and communications to all oil fields, Saudi Arabian cities and countries overseas. These functions have affected the position of Dhahran in many direct and indirect ways, and Dhahran became the business centre for oil affairs in the Eastern Province. The residential areas for both married and bachelor employees grew up around the administrative buildings, along with the social services, which include the health centre, restaurants, halls, schools, cinema and recreational areas. An indirect result has been the choice of Dhahran as the site of the international airport and the Petroleum University, in addition to some other offices (eg. Petromin and various government offices.)

2. <u>Other Functions</u>: Dhahran first established as a self-contained oil-camp has grown into virtually a new town serving the population of three quarters of Dhahran,

the family quarter for the senior staff of the oil company, and Salamah and Monira quarters. Each quarter has been provided with the facilities to give the population all their daily needs. The main local Suq of Dhahran is located in Al-Salamah itself; in this suq are found limited quantities of a large number of commodities; restaurants and coffee shops are found in the area surrounding the suq. The meat market, bakery, offices, court, police station and police headquarters and the northern part of the hospital are also near the suq. Monirah quarter fulfills a limited function and is mainly a residential area for the general oil employees. In this quarter are found Aramco TV studio, Saudi Arabian Government House and Police Station. The main quarter in Dhahran is Dhahran Quarter for the families of the senior staff, which is also a self-contained small town, comprising the administrative and other offices, a bank a hospital, family issue store, ladies' and gentlemen's hairdressing salons and various other shops and garages. (See Table 8.83 showing the distribution of facilities in Dhahran).

Public Utilities

Aramco has services to cater for all the daily needs of the inhabitants of the three quarters of Dhahran. These services include water, sewage, power and air-conditioning, along with telephone, radio and television.

Water

Drinking water for residents of Dhahran is drawn from wells; it is first permutit treated and then distilled for drinking purposes. The water systems can handle 17,000,000 gallons of water and 350,000 gallong of distilled water per day.[29] All family housing and bachelor dormitories receive piped water from this system.

Sewage

A modern sewage system and treatment plant has been installed. Sewage disposal covers all three quarters of Dhahran.

TABLE 8.83

DISTRIBUTION OF BUSINESSES IN THE MAIN SHOPPING CENTRE OF DHAHRAN (1973)

Group	Type of Businesses	Dhahran Quarter	Salamah Quarter	Monirah Quarter	Total
2	Suq	-	1	-	1
	Meat Market	-	1	-	1
	Family Issue Store	1	-	-	1
3	Baker	-	1	-	1
7	TV Studio	-	-	1	1
	Theatre	1	-	1	2
	Record Centre	1	-	-	1
8	Cafeteria	-	-	1	1
	Snack Bar	1	-	-	1
9	Men's Hairdresser	1	-	-	1
	Ladies' Hairdresser	1	-	-	1
	Laundry	1	-	-	1
10	Part Store Building	1	-	-	1
	Type of Workshops				
	Power Transformer	1	-	-	1
	Electricity Substation	-	1	1	2
	Gas Station	1	-	-	1
	Gas Storage	1	-	-	1
	Industrial Zone	1	-	-	1
	Storage Yard	1	2	1	4
	Ice Plant	1	-	-	1
	Carpentry Shop	1	-	-	1
	Tyre Repair Shop	1	-	-	1
	Paint Shop	1	-	-	1
	Vehicle Paint Shop	1	-	-	1
	Garages	5	-	-	5
	Heavy Duty Maintenance Shop	1	-	-	1
	Arts and Crafts	1	-	-	1
	Type of Offices				
	Housing Office	1	1	-	2
	Service Buildings	-	-	2	2
	General Office	1	-	-	1
	Bank	1	-	-	1
	Transport Office	1	-	-	1
	Court	-	1	-	1
	Offices	2	-	-	2
	Post Office	1	-	-	1
	Police Station	-	2	1	3
	Type of Social Services				
	Schools	1	-	-	1
	Hospital	1	1	-	2
	Mosques	-	4	1	5
	Common Buildings	1	-	-	1
	Fire Station	1	-	-	1
	Youth Centre	1	-	-	1
	Women's Group	1	-	-	1
	Recreational Areas	3	1	1	5
	Swimming Pool	1	2	1	4
	Volley Ball Courts	-	1	-	1
	Playground	-	1	-	1
	Soft Ball Yard	1	-	-	1
	Taxi Station	1	1	-	2
	Bus Station	1	1	1	3
	Parking Areas	5	1	-	6
TOTALS		51	24	14	89

Source: Fieldwork

Electricity

The power plant at Dhahran is connected with those at Ras Tannura and Abqaiq, and power is produced for domestic and industrial uses. Each system is capable of supporting the others should one fail.

In 1954 the first power plant commenced operations in Dhahran on 1 April 1954.[30] By 1955 the capacity had increased to 21,600 Kwh. In 1954 a power plant was installed in the service centre in Dhahran; the centre co-ordinates the power transmissions for all towns to increase efficiency and ensure an uninterrupted supply of power to all company facilities.[31]

At the end of 1955, the total generating capacity of the plants at all three towns was 84,000 Kwh, rising in 1960 to 96,000 Kwh and during 1972 the generating capacity rose to 182,000,000 Kwh.[32]

Air Conditioning

Air conditioning is necessary in Dhahran particularly during the summer season; the temperature is very high on most days and the air is extremely humid at night. Both family and dormitory accommodation are equipped with air conditioning to cool the air in the hot summer, and warm it in the winter, and air conditioning plants are scattered throughout the three ARamco communities at Dhahran, Ras Tannura and Abqaiq.

Television and Radio (private)

Aramco established a TV station at Dhahran which began transmitting to all employees' camps in the Eastern Province in 1957, and at that time there were about 380,000 Arab-Speaking viewers. The station was HZ.22 TV, and broadcast an average of thirty-seven hours per week.[33] This TV station remained on the air until the Saudi Arabian government TV began transmissions in the 1970's when the Aramco company closed public stations and transmitted only to its company towns.

Aramco also operates a small radio station privately, at Dhahran, to broadcast to its employees towns. Three musical programmes - one classical and two popular - are broadcast by FM wave to Ras Tannura, Abqaiq and other communities.[34]

Social Facilities

Schools and University

Dhahran has one private school (See Section F table 8.84), follow American educational programmes, with mixed classes of boys and girls from Kindergarten to intermediate levels; children are then sent at the company's expense for higher education to Bahrain, Europe and USA.

The Petroleum University has recently developed and expanded from College to University level and has several departments, all connected with work in the oil industry (See Fig. 8.84).

Hospitals

Dhahran has only one private 105 bed hospital, owned by the oil company, which has a staff of 69 physicians, 1 physiotherapist, 2 pharmacists, 148 male nurses and operating assistants and 160 female nurses and midsives.[35] The hospital is housed in two separate buildings one in Dhahran senior staff quarter and the other outside the Dhahran quarter on the main road to Al-Khobar and Dammam, between Salamah and Al-Monirah quarters. Dhahran also has a dental clinic in the Dhahran quarter to the east of the hospital.

Hotels

There are no hotels in the residential area of Dhahran quarter or even in Salamah and Monirah quarters. The only hotel in Dhahran is the first class Airport Hotel, near Dhahran Airport.

Banks

Dhahran has no public bank, although there is a company bank for Aramco employees in the administrative building in Dhahran quarter.

FIG. 8.84. THE PETROLEUM UNIVERSITY AT DHAHRAN.

Religion

The majority of Dhahran's population is non-Muslim; most of the inhabitants of Dhahran senior staff quarter are Christians. Salamah and Monirah quarters are mainly inhabited by Muslims and Dhahran's five mosques are situated in these two quarters - the Friday mosque is in Salamah quarter.[36]

Transport Stations

In Dhahran there are three bus and two taxi stations, distributed around the three quarters. Two stations (one taxi and one bus) are located in Dhahran quarter; Monirah quarter has only one station for buses. The remaining stations (1 taxi and 1 bus station) are in Al-Salamah quarter. There are also eight taxi stand points in Dhahran quarter and the buses and taxis on service at these stations and stand points are partly owned by Aramco for use by their employees, and their families.[37]

Parks and Recreational Areas

There are no specific parks anywhere in Dhahran, but there are two children's playgrounds and several green areas. Recreational facilities available in each quarter include tennis courts, volley ball courts, health centre, swimming pool, bowling alley, a theatre and a cinema, and reading halls.[38]

Parking Areas

Dhahran residential areas are provided with parking areas; one in Salamah quarter, four near the administrative buildings, three near and within the industrial zone, one near the dining hall and other small parking areas are scattered over Dhahran quarter.

Conclusion

Dhahran is therefore a cantonment settlement, a foreign transplant set down in Arabia. Economically it is responsible for the major source of wealth in Saudi Arabia, i.e. oil production. Functionally in the past and still to some extent, it supplies technology and 'know-how', e.g. in Dhahran was carried out the first urban planning in the Eastern

Province, from it was organised a variety of applied research programmes in agriculture and other things. Although with little industry, the Aramco Light Industries Development Department still plays an active part in guiding industrialisation in the Eastern Province. Nevertheless as an urban settlement it is very specialised and limited and is most important as one element in the 'golden triangle' urban region which includes Dammam, Al-Khobar and Dhahran.

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F. A Preliminary Comparison of some of the characteristics of the five-case study settlements

In Chapter 4 a population size ranking of the urban settlements of the Eastern Province was made utilizing the only census data available, that for 1962-63. For four of the five case studies a personal estimation of populations for more recent years was made by aerial photograph analysis and although the errors involved may be of the order of 10% $\pm$ they form the only basis on which a size-ranking can be made. In the case of Dhahran such an approach cannot be adopted because the population is made up of three groups with entirely different household sizes; American expatriate families, expatriate and Saudi Arabian bachelors and Saudi Arabian families. The spatial segregation and the homogenesity of each these groups are considerable but not great enough to allow even of household size generalisation by quarters within the town. The special functional characteristics of Dhahran can only be comparatively studied by using other criteria.

A simple ranking of population size (1970 estimates) of four towns (2 old, 2 new) is as follows:

Hofuf 78,000
Dammam 43,000
Al-Khobar.....38,000
Qatif 15,000

First, let us briefly examine the relative ranking of these towns in terms of various other criteria. In Chapter 6, Table 6.16 the number of industrial establishments in each town in 1972 classified by the Ind.Studies & Dev.Centre is shown and Dammam stands out with almost 60% of the Provincial total followed by Al-Khobar with 23% and Hofuf with 10.8%, and Qatif with none. The two old oasis towns average as having between them an insignificant proportion of manufacturing industry.

Dhahran, was noted on p 374 Table 8.83 as having very small industrial zone which houses a very small number of workshops mainly for servicing vehicles. A comparison of average size of establishment

by number of employees (see Tables 8.8, 8.39, 857 and.8.76 using data and classifications of the Ministry of Finance 1971) allows us to take this argument further. Hofuf has 1135 industrial employees but the average number per establishment was only 2.5 as compared with Al-Khobar's 4.9 and Dammam's 6.8. A grading of towns by average size of industrial establishment work-force (Ministry of Finance 1971) produces the same ranking as does the number of industrial establishments (Industrial Studies and Dev.Centre 1972) i.e.Dammam first, Al-Khobar second and Hofuf third.

If we examine the comparative situation for commerce and services using the same data a slightly different situation first appears in that by number of establishments the ranking is:

1. Dammam; 2. Hofuf; 3. Al-Khobar; 4. Qatif; 5. Dhahran

but for total employees the order becomes -

1. Dammam; 2. Al-Khobar; 3. Hofuf; 4. Qatif; 5. Dhahran

The average size of the total labour force in all commercial establishments is not in itself significant because small specialised services, i.e. in insurance, become equated with small petty trading retail businesses. If, however, we calculate the average size of commercial establishments wage-paid employees then the ranking becomes quite different:

1. Al-Khobar (3.8); 2. Dammam (1.5); 3.Hofuf (0.5); 4. Qatif (0.2)

Dhahran's commercial services are so dominated by provision made by Aramco that they cannot be compared with the others.

This preliminary ranking by commercial establishments reflects the observed functional differences in retailing and shopping.

The shopping centre of Hofuf and other selected urban centres in the Eastern Province, such as Qatif, Dammam, Al-Khobar and Dhahran, can be classified by which has the easiest accessibility, the size of daily business, and which is the most important supplier of specialist goods and services. For each type of business, with regard to these three points, there are very significant results, which indicate a

a decline in Hofuf's importance to consumers as the main regional centre for the Eastern Province.

Dammam can be classified as the Provincial centre and Al-Khobar as a specialised centre for shoppers in the whole of the Province by the variety of goods and range of businesses and services. Large differences exist between the shopping centres of Dammam and Al-Khobar in the hierarchical levels for foodstuffs and some non -food items, as Dammam is the main centre for a number of retailers. Larger differences were also observed in both the type and quality of luxury goods, ladies' clothing, cloth and jewellery, whereby goods on sale in Al-Khobar appear to have a more specialised nature than in Dammam. But for items like furniture, carpets, TV sets, electrical goods, kitchen appliances, cycles, hardware and men's and women's traditional clothing etc, there was very little difference between the two centres; both offered a wide variety of choice, although Dammam probably had more shops.

Hofuf is the local regional centre for Al-Hasa Oasis and ranks as the third shopping centre in the Eastern Province, supplying areas of Al-Hasa Oasis. When compared with Dammam and Al-Khobar, Hofuf ranks second to Al-Khobar as a sub-regional centre and offers a more limited range of goods, and in general has smaller businesses and less service facilities. Hofuf is supplied with both food and non -food commodities by main dealers in Dammam, the chief port in the Province, and many of Hofuf's merchants travel to Dammam to obtain supplies.

Qatif is the local high-street centre and ranks as the fourth most important functional urban centre, serving only Qatif Oasis, although it is not a large enough town to provide a sufficiently wide range of goods (food and non-food) and services to satisfy all the requirements of the area. Many people make the 12 Km.journey between Qatif and Dammam daily in order to have a wider choice of goods to choose from.

Dhahran is the main headquarters of the oil company; it has very limited functions as an urban or shopping centre, and is merely the

administrative centre for the oil industry. The shopping centre at Dhahran is extremely small, but as the town is only a short distance from Al-Khobar (10 km) many of the oil employees living in Dhahran travel daily to Al-Khobar for their shopping, even the everyday necessities such as bread,milk, vegetables and fruit etc. There are a few small 'corner' shops, with a limited range of general goods as well as a small family issue store, at the Senior Staff quarters, which is open for a short while during the day.

Lastly, we can attempt a ranking by the provision of social services such as hospitals and schools, and also banks and hotels from personal survey data collected in 1973. (see Table 8.84).

To a considerable extent the table indicates a social services provision response to demand as expressed by population size. Nevertheless, Dammam with a population 55% of that of Hofuf has a greater number of normal schools and pupils attending them at all levels. Hofuf in education has the largest number of special schools and adult classes this reflecting differences between the educational and health backgrounds of the oasis population of Al-Hasa and the immigrant urban population for example of Dammam.

This summary recording of some of the major differences in the functional provisions made in the case-study settlements indicates the lines on which, in Chapter 9 we can in conclusion attempt to construct a hierarchial ranking of the major settlements.

TABLE 8.84: A Comparison of the five case-study settlements; size of selected service sectors (1972 and 1973)

Population Estimates 1960/62 1970	Settlements	Ranking	* SCHOOLS Kinder-garden & Elemen-tary	Inter-mediate	Second-ary	Teacher Training	Special	* PUPILS Kinder-garden & Elemen-tary	Inter-mediate	Second-ary	*State and Private Hospitals	* Hospital Beds	* Clinics	* Other Medical Units	Private Doctors	Retail Chemists	Hotels	Banks	Money Changers
22,000 / 43,000	Dammam	1	44	9	3	3	2	16772	2919	851	2	295	2	3	9	19	7	7	7
63,000 / 78,000	Hofuf	2	41	8	2	3	4	15576	2489	587	2	405	4	-	14	9	3	1	-
20,000 / 38,000	Al-Khobar	3	28	7	2	2	-	8439	1837	494	5	354	1	-	9	36	8	11	7
11,000 / 15,000	Qatif	4	8	4	2	-	1	4404	813	325	1	100	-	-	4	4	-	2	-
**	Dhahran	5	1	-	-	-	-	766	-	-	1	105	-	-	-	-	1	1	-

** Dhahran population see p. 382 (Section F)

Sources: * Ministry of Finance, Central Department of Statistics

Others from personal survey

CHAPTER NINE

Locational and spatial Analysis

Urban

In chapter 4 we adopted a population of 2500 as the minimum size criterion for defining an urban settlement (see Fig.4.21). In the Eastern Province however no population census data is available for later than 1962-63 and more recent estimates from air-photograph house counts could only be made for the few settlements for which air-photographs were obtainable. Town maps, necessary not only for morphological analysis but also for the spatial plotting of function data, could also only be made for the case-study settlements, given the availability of air-photographs and of time. Field survey of the distribution of functions within towns also had to be selective because of time limitation. For some purposes therefore attention has hadto be confined to a small number of urban samples.

An examination of the spatial distribution of the urban settlements and an analysis of their functions in terms of central place theory is attempted here in spite of the paucity of data since even a small sample should indicate the presence of an urban hierarchy and test the validity of the use of this and associated concepts in this region.

In the Eastern Province the urban centres are found in three main clusters, the southern area (Al-Hasa Oasis), the midland area (Dammam, Al-Khobar and Dhahran) and the northern area (Al-Qatif Oasis and the surrounding areas).

The sourthern cluster of settlements, the Al-Hasa area, contains two towns with a range of urban functions, Hofuf and Mubarraz, and 63 other sedentary settlements. In 1962-63 this area contained 37.7% of the province's population but by now this proportion is certainly smaller as a result of the very rapid increase in size of the Midland towns (no census data is available). The Al-Hasa settlements were entirely dependent on the irrigation potential of Al-Hasa oasis and, although the history of occupance of various parts of the oasis cannot

now be reconstructed in detail, each separate location was clearly governed by the location of springs and of cultivable soil. In Chapter 3, the destructive effect of the movement of sand dunes from the N.N.W. was noted. The oasis and its settlements are a relic of a once larger area; it is also striking that Hofuf and Mubarraz are sited in the south-west corner of the oasis furthest from dune movement and also near the greatest concentration of artesian water.[1] The study of the spatial hierachy within the Al Hasa cluster requires a separate study of 65 sedentary settlements together with 52 nomad settlements and cannot be attempted here. Nevertheless, we can postulate that within the cluster Hofuf is the highest order centre and Mubarraz, 3Km distant, is the next highest. An examination of the lower order hierarchy would necessitate the use of a 'moving-point' solution of the type desribed by M.E.Hurst.[2] What is of significance here is that the two towns are separated by 170Kms from the nearest other urban centres of similar order of size.

Dammam and Al-Khobar, together with Dhahran (which as indicated in Chapters 6 and 8 is of a different order of size) form a second spatial group - to which the term "Golden Triangle" was earlier applied.

In Chapter 4 pp 85-86 the conurbation - like characteristics of this second settlement cluster were noted and in Chapter 8, Section F, were summarised some of the functional characteristics of the two largest towns in the cluster, Dammam and Al Khobar. Further analysis follows later in this chapter.

The northern-most and most diffuse group - Al-Qatif and others - includes relatively smaller settlements such as Jubail and Ras Tannura and is not strictly an 'urban' area.

If the main functions of the various cities, as described in earlier sections, are considered alongside size and general spatial location, then we begin to understand the nature of urban evolution in the region.

The distance isolation of Hofuf and Mubarraz shows in the way in which retail prices in those towns tend to follow a distinct pattern, while wholesale prices in general conform to those in Dammam. This is also a reflection of the fact that Hofuf and Mubarraz are the chief centres for the set of minor settlements which make up the Al-Hasa Oasis network, and with which they are economically and socially inter-twined. The two cities have a range of functions with no very specialised characteristics; they are sub-regional general purpose urban centres.

When we examine the midland area urban centres we find much greater functional differentiation. From the data presented earlier we can now make the following generalisations:

Dammam is the regional administrative capital, the most important centre of general industry and commerce, the most important non-oil port and the railroad centre; although smaller than Hofuf in population it is the only city which can claim functional regional/provincial predominance.

Al-Khobar is more specialised as the main retail shopping centre - particularly for the expatriate population. It also houses the head-quarters of a large proportion of foreign business companies.

Dhahran is even more specialised as the headquarters of the overwhelmingly predominant oil company, the residence of the oil company expatriates, the site of the Petroleum University and the international airport.

These three towns, sited very close to each other, in combination collectively have the complete range of functions which would be associated with a high order urban centre. They constitute an urban cluster region in which scale economies in commerce and industry and low transport costs have produced rapid growth and a tendency to join with each other in a way which is likely in the future to create a single metropolitan region for the Eastern Province.

Before proceeding to more detailed analysis a summary of the characteristics of other settlements can be made. Between these "Golden Triangle" and Al-Hasa lies a single urban settlement, Abqaiq, the small urban area between Hofuf and Dhahran, which has one function as a small residential settlement for Abqaiq oil field employees.

Ras Tannura, north-east of Al-Qatif, is similar to Abqaiq as a small, single purpose centre, in this case as a shipping and refinery site for oil.

Al-Jubail is, at the moment, a small fishing town, also serving a very small nearby community with a small range of goods. Future planned developments however, are likely to transform this centre. Apart from special developments, such as Jubail, the centres in which long-term functional changes might occur are Hofuf and Mubarraz. If the old ruined harbour of Al-Uqair, 75Km distant was developed as a large port with associated manufacturing industries, the Al-Hasa potential of population, agriculture, water and good land for more development could give rise to further growth. But at the present time this is a zone of relative decline. The young population are emigrating from Al-Hasa; many farmers have left, and are leaving their farms seeking work in the oil industry to the north, in spite of the new irrigation system profject. Hofuf and Mubarraz are now not only importing goods from wholesale centres of the Dammam urban area, but many people go weekly shopping for specialised goods not found in Hofuf, to Dammam and Al-Khobar. This type of functional order relationship is not easily changed.

We can also note the decreasing relative size of established urban areas as the number of urban areas increases. This applies clearly to the position of the old urban centres of Hofuf and Mubarraz, compared with the new urban centres of Dammam, Dhahran and Al-Khobar. Since the discovery of oil in 1938, the old urban areas of the Eastern Province which are a long distance from the main oil sites, have suffered a decrease in size as the more specialised new urban areas of Dammam, Al-Khobar and the smaller centres grew.

As Dammam and Al-Khobar continue to specialise in manufacturing, there are a number of small communities growing up within the Dammam, Al-Khobar and Dhaharan triangle in addition to others scattered within the whole of the Eastern Province areas. These communities will develop within and between the large urban areas in particular, with the special functions such as residences for the industrial workers. This will continue to give rise to exceptionally large urban areas or closely spaced clusters of similar sized urban areas. Such an urban spatial system illustrates the elements most likely to be found in practice - a regular size/space system, based on market functions, a linear pattern related to external scale economies, particularly at resource-oriented locations.[3] The relationship between size, scale economics and agglomeration processes is examined later in this chapter.

Central Place Functions and Central Place Theory

The general situation of the central place functions here are affected by distribution of populations, which plays an integral part in the urban area. Central place theory was introduced by Walther Christaller in 1933. The concept behind the model proposes that:

> 'towns with the lowest level of specialisation would be equally spaced and surrounded by hexagonally-shaped hinterlands. For every six of these towns, there would be a larger, more specialised city which, in turn, would be situated at equal distance from other cities with the same level of specialisation as itself. Such a city would also have a larger hexagonal service area for its own specialised services. Even more specialised settlements would also have their own hinterland, and be located at an equal distance from each other." 4

The modified theory, built up by Isard in 1956, has pointed out that:

> 'the spacing of urban areas should be increasingly fine as the metropolis is approached.' 5

As Berry and Garrison have emphasised,[6] fundamental to the theory is that each central place belongs to one or other classsubset, that each class possesses specific groups of central functions and each place is characterised by having a discrete population. The hierarchy of

functional economic specialisation means that each class in ascending under possesses functions additional to those of the class below. Thus the smallest centre-first order- will only serve its own discrete population, the second order-centre will (a) serve its own discrete population with first and second order functions, (b) serve a proportion of the populations of neighbouring first order centres with second order services and (c) serve a proportion of first order centre populations also with some first order services since once the threshold of travel to a higher order centre is crossed a consumer will probably use all the functions available. As we shall see later this is of importance in a consideration of internal urban patterns as well as in inter-urban space relationships.

The basic Christaller marketing principle was based on the minimisation of travel and therefore produced a maximisation of the number of central places - the K=3 network in which each order centre serves the equivalent of 3 lower order centres. Berry and Garrison added the concept of threshold of size of market to improve the flexibility of the model; low order functions supplied by low order centres are high frequency demands made of goods and services over relatively small market areas, high order functions conversely have low frequency demands and the market area must be correspondingly larger.

We must also note Christaller's traffic principle which states:

"The distribution of central places is most favourable where as many important places as possible lie on one traffic route between two towns."

This K=4 network will clearly depend on the transport network and in non-uniform conditions can be associated with special nodality concepts.

Further developments in central place studies have been carried out by many urban specialists such as B.J.L.Berry and W.L.Garrison[7], H.E.Bracey,[8] I.Carruthers,[9] J.E.Brush,[10] W.K.D.Davies,[11] P.Haggett,[12] and R.W.White author of the most recent study in central place theory in dynamic terms.[13]

J.H.Johnson has pointed out that, the discrepancies can be expected between the theoretical and the actual distribution of central places, even in areas where physical geography has not had an important influence on the distribtuion of population. But the discrepancies do not invalidate the discussions of central place theory, because they are basically concerned with location of service centres in a hypothetical situation where only economic factors are operating.[14] These theories are practical illustrations of the plausibility of the concept of a hierarchy of central places. They support the contention that the hierarchy concept is realistic, and therefore possessed of explanatory power.

Christaller's basic and modified models for the central place theory and that of Isard for the spacing of urban areas, are not easily applied to the uncontrolled hierarchy system of the urban areas in the Eastern Province at present. The reasons for this lie in time and in place. As already pointed out, even if we assume uniform space, in the Eastern Province we are observing urban centres of a great variety of ages and a rapid change of functions through time. The present situation is therefore extremely dynamic and in geomorphological terms, immature. Settlements range from the oasis towns in which there are still many non-urban close and direct connections with traditional agriculture, to an oil export terminal where economic activity is specialised and the residential sector unimportant. Only in the midland urban region of the "Golden Triangle" is there much social or economic homogeneity and even here as the population analysis showed, there is still great mobility and change.

Spatial variations of a directly geographical character are of especial importance in such an early and dynamic period of urbanisation. First, oil, as the mainspring of economic activity, came suddenly to a country of simple traditional technology; its value lay in its export potential. Inevitably, the points of export and import - in this case

coastal in location - were points of growth. The number and location of such coastal growth points was necessarily conditioned both by specific costs relating to oil-handling, and the time sequence of oil field discovery, as well as by coastal geomorphology and marine conditions. Ras Tannura was a site chosen for one set of oil industry operational reasons; Dhahran was another. The development of Dammam was similarly conceived as a unique phenomenon in itself, but set in a particular operational concept. Present plans for Jubail follow the same trend of industrial rather than urban location decisions. The past decisions which led to the establishment of fishing villages and traditional ports have been buried.

In the interior we see both the survival of the traditional land-resource based settlement pattern - oasis dominated - and the appearance of new settlements based on the exploitation of the newly discovered land resources, eg Hofuf and Qatif on the one hand, Dhahran and Abqaiq on the other. Before the coming of oil, given the environmental characteristics described in the opening chapters, sedentary settlement was possible in a very few scattered localities, whose positions were determined by climate, geomorphology, hydro-geology and the land-sea junction line. Settlements lived on the products (and small-scale trade in these products) of oasis farming and Gulf fishing and pearling. Elsewhere there was an ocean of hostile desert and sebkhah, across which ran a few lightly used routes, supporting tiny 'nodal' staging posts.

Since the discovery of oil, oil exploitation, the discovery and extraction of deep groundwater and the wealth to support seawater de-salination, have reduced the absolute importance of some physical constraints. The costs of overcoming these contraints - topographic, water-supply, climate, however, remain. Therefore, while there is still no real uniformity of space, there are different and changing evaluations of the differences in space.

What however may be identified at the moment as some forms of spatial hierarchy?

Evidence in the study area show that varying sizes of settlements exist. Here small towns and villages in agricultural areas such as Al-Hasa and Qatif Oases exist mainly because of their function as central places for the exchange of goods and services, each for its own local farm trade area and, in the case of the larger towns, of clusters of such areas. In addition towns and settlements exist in the newly settled areas of the province because of their function as central places first for the oil industry and secondly for all the activities associated with oil extraction, transportation and processing, the two most important of such centres being Damman and Al-Khobar.

In the case of the Eastern Province settlements there is very strong evidence that the oldest settlements were built when the most common means of transport was by camel and donkey. When railway and roads were built larger centres developed along the routes, in some cases on the sites of earlier settlements; and the motor-vehicle is now encouraging the relative growth of other settlements, e.g. the Tapline road from Dammam to Qaiysomah in the north has made possible the growth of the small settlements which were first established solely as pumping centres for the Tapline oil pipeline.

In Cahpter 8 Section F we very briefly summarised some of the functional differences. If we analyse these further and place them in space then a skeletal spatial hierarchy at least appears. First, only one town possesses Provincial administrative functions - Dammam.

Dammam has the following provincial headquarter offices: Emirate, Ministry offices of Finance, Agriculture, Commerce, Foreign Affairs, Education, Labour and Social Affairs, Sub-Ministry offices of Petroleum and Immigration and General Control Bureau, as well as the Police Administration, Chamber of Commerce and Municipality. All Government offices in all other settlements are subsidiary of the provincial offices in Dammam. Dammam is the national headquarters for the railroad.

Hofuf has six subsidiary government offices: Municipality, Emirate, Qadi Court, Education and Police, together with the Al-Hasa Agricultural Development Office.

Qatif has three subsidiary government offices: Municipality, Minor Court, and Qatif oasis agricultural development office.

Al-Khobar, apart from the Municipality office as a branch office of the Immigration Department.

Dhahran only has a Qadi'sCourt, the senior court in the province, a status surviving from the days of oil-camp establishment. There are no other government offices in the Eastern province (excluding police stations).

Clearly Dammam for most administrative purposes dominates the whole province. Hofuf and Qatif offer a small number of administrative functions for their respective oasis areas but while Qatif is almost entirely dependent on nearby Dammam, Hofuf's greater range of subsidiary administrative functions is derived from the greater size of the oasis of Al-Hasa and its relative distant remoteness from Dammam. In an administrative hierarchy then Dammam is the undisputed main central place, Hofuf is a secondary centre for a separate settlement cluster, while all the others have some different minor functions only relevant to their immediate localities.

Also in Chapter 8 Section F, we summarised the most important criteria for ranking the case-study settlements in industrial and commercial terms. In commerce the hierarchy is slightly different depending on whether the number of establishments or the number of wage-paid employees is used as the criteria, but in either case Dammam and Al-Khobar appear as the highest ranking pair, followed by Hofuf, Qatif and Dhahran in that order. In spatial terms, however, we can identify a two cluster system as follows.

The lowest order settlements are the villages of the oases of Al-Hasa and Qatif. In Al-Hasa one finds one higher order town, Mubarraz and one higher still, Hofuf. Hofuf remains however subsidiary

not to one other single town but to the Dammam-Al Khobar complex in the Midland region. This is the Al Hasa cluster of secondary hierarchy.

Within the Midland region, Dammam has the largest number of each type of commercial establishment except for financial firms, of which Al-Khobar has one more. Al Khobar as noted earlier has some specialised commercial functions which make it for some limited purposes more important than Dammam. Qatif is for most commercial purposes dependent on Al-Kohbar and Dammam for relatively high order services and in turn provides lower order services to its own population and that of the oasis. Dhahran, as a cantonment town, offers some specialised services to its population of senior and mainly expatriate ARAMCO employees and their families but this population otherwise uses Dammam and Al-Khobar. Thus in the Midland region we have a regional hierarchy which for the highest order services is also a Provincial hierarchy.

Within this inter-urban spatial netwrok we then find internal central place hierarchies in each settlements. It has been possible to identify some of these by the measurement of concentration as follows. The personal survey of establishments as shown in Figs. 8.24, 8.38, 8.56 and 8.70 indicated varying degrees of location concentration. In each case, the numerical centre of gravity of establishments was found to lie on or near to one main street. For purposes of comparison a street frontage of 1000 metres was taken, centred on the numerical centre of gravity. Since, as it noted below, in the case of Dammam and Al-Khobar, the concentration occurs in a narrow zone of parallel and very near streets, the measure of concentration shown is not strictly a measure by street frontage but the linear form of many distributions is very strong. Moreover, the proportions (by percentage) of various classes of establishment becomes strictly comparable if we take each high concentration zone to be 1000 metres long and 100 metres wide, this can then be regarded as a "main" street linear concentration.

From the urban survey data collected and shown in (Tables 8.15, 8.31, 8.48 8.64, 8.65 and 8.66) the following proportions of main streets frontage concentration of commercial and administrative and social services facilities appears. (In each case the units within the covered suq have been separately counted.) This data refers to the zones shown in (Table 9.1 and Fig.9.1)

Table 9.1: Numbers and Proportion (%age) of establishments by Class located in main street linear concentrations

Hofuf = (Municipal Square, Al-Khamis and Al-Uam Streets)

A	-	Foodshops (groups No.1,2, and 3) - 51	.....	34.4%
B	-	Other Specialised (groups No .4,5,6 and 7) - 173	.....	79.4%
C	-	Eating Places and other Services.(groups 8 and 9) - 26.		40.0%
D	-	Hardware, Building Materials and Others (Groups No .10 and 11) - 10	.....	18.9%
E	-	Administrative - 11	.....	31.4%
F	-	Social Services - 20	.....	54.1%

Qatif =(Main Street)

A	-	Foodshops (Groups No .1,2 and 3) - 28	.....	35.9%
B	-	Other specialised shops (Groups No. 4,5,6 and 7) - 20..		50.0%
C	-	Eating Places and other Services (groups 8 and 9) -10..		31.3%
D	-	Hardware, Building Materials and Others (Groups No .10) - 7	.....	38.9%
E	-	Administrative - 5	.....	50.0%
F	-	Social Services - 9	.....	50.0%

Dammam: (Three parallel shopping streets 100 metres apart at maximum)

a) King Street

A	-	Foodshops (Groups No.1,2 and 3) - 24	.....	13.9%
B	-	Other Specialised Shops (Groups No. 4,5,6 and 7)-42 ..		11.0%
C	-	Eating places and other services (Groups 8 and 9)-37..		18.2%
D	-	Hardware,Building Materials and others. (Groups No .10 and 11) - 50	.....	37.0%
E	-	Administrative - 17	.....	31.5%
F	-	Social services - 12	.....	38.7%

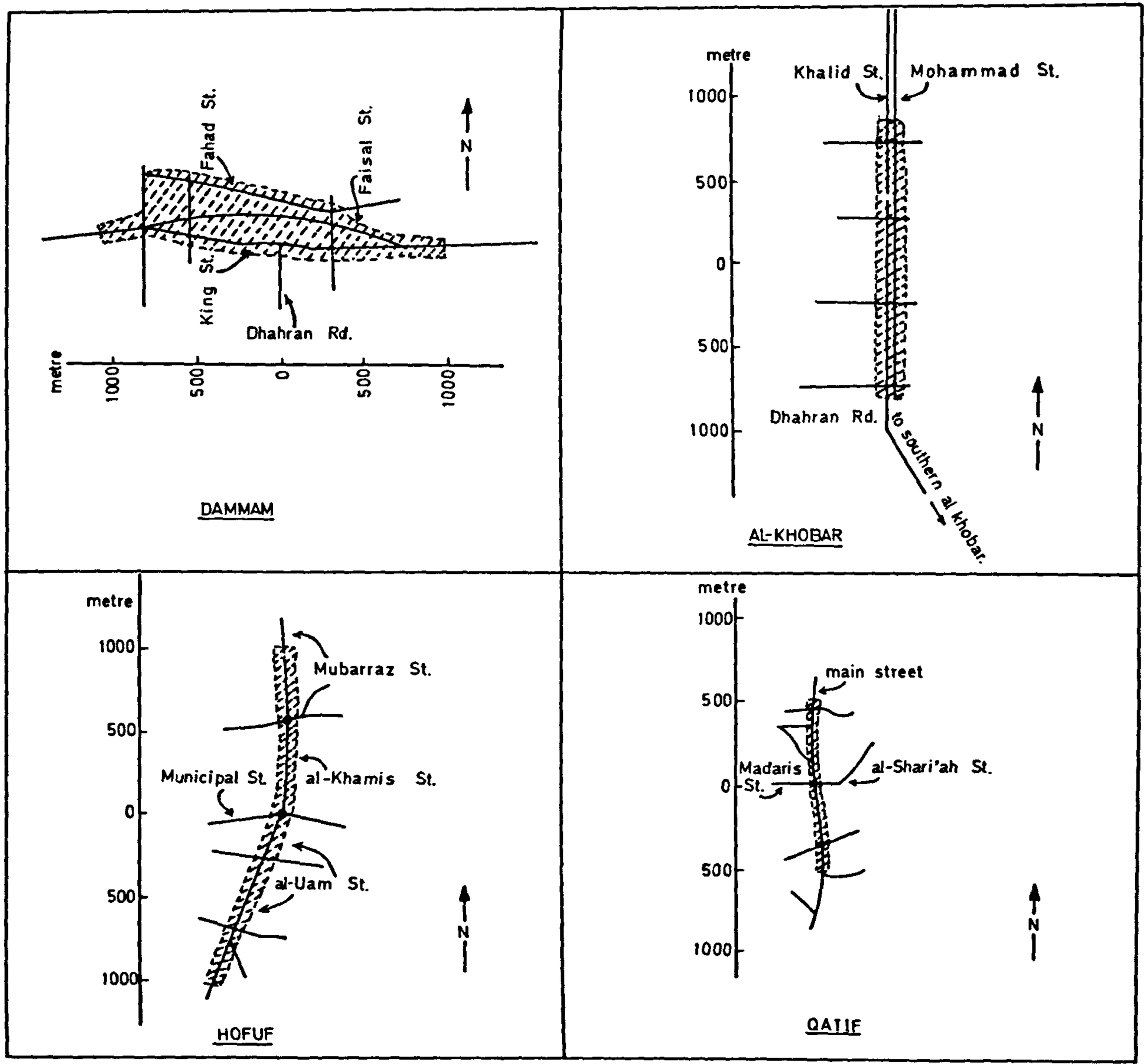

FIG.9.1 LINEAR ZONES CONCENTRATION OF COMMERCIAL, ADMINISTRATIVE AND SOCIAL SERVICES.(see table 9.1)

(High concentration zone)

(b) King Faisal

A	-	Foodshops (groups No .1,2 and 3) - 19	.....	11.0%
B	-	Other specialised shops (groups 4,5,6 and 7) - 60....		15.7%
C	-	Eating places and others (groups 8 and 9) - 55....		27.1%
D	-	Hardware,Building Materials shops and others (Groups 10 and 11) - 55	.....	40.7%
E	-	Administrative - 17	....	31.5%
F	-	Social Services - 4	....	12.9%

(c) Fahad Street

A	-	Foodshops (groups No .1,2 and 3) - 16	.....	9.3%
B	-	Other specialised shops (groups 4,5,6,and7) - 209.....		54.9%
C	-	Eating places and others (groups 8 and 9) - 38		18.7%
D	-	Hardware,Building Materials shops and others (groups 10 and 11) - 1	.....	0.7%
E	-	Administrative - Nil		
F	-	Social Services - 1	.....	3.2%

Al-Khobar

(i) (Two parallel shopping streets 30 metres apart at maximum in the nothern Al-Khobar)

(a) Khalid Street

A	-	Foodshops (groups No .1,2 and 3) - 7	.....	9.9%
B	-	Other specialised shops (groups No .4.5,6 and 7) - 118 .		41.3%
C	-	Eating places and other services (groups Nos.8 and 9)-22		26.2%
D	-	Hardware, Building materials shops and others (groups No .10 and 11) - 10		15.4%
E	-	Administrative - 20	.....	23.5%
F	-	Social Services - 3	.....	13.6%

(b) Mohammed Street

A	-	Foodstuffs (groups No.1,2 and 3) - 27		38.0%
B	-	Other specialised shops (groups No.4.,5,6 and 7) - 44 ..		15.4%
C	-	Eating places and other services (groups No .3 and 9) -29		34.5%
D	-	Hardware, Building Materials shops and others. (groups No .10 and 11) - 5	.....	7.7%
E	-	Administrative - 2	.....	2.4%
F	-	Social Services - 1	.....	4.5%

Al-Khobar is the only settlement which has in addition to the main central area completely separate minor residential and service districts (see chapter 8 section D), each of which has its own central concentration of services.

(ii) Southern Al-Khobar Main Street (Old Suq)

A - Foodshops (groups No .1,2 and 3) - 5 .... 26.3%

B - Other specialised shops (groups No .4,5,6 and 7) - 3 ... 60.0%

C - Eating places and other services (groups 8 and 9) -6 ... 31.6%

D - Hardware,Building materialsshops and others (groups No .11 and 12) - Nil

E - Administrative - Nil

F - Social Services - 1 .... 14.3%

(iii) Al-Thugbah Main Street (Yanbu Street)

A - Foodshops (groups No .1,2 and 3) - 27 ..... 58.7%

B - Other specialised shops (groups No .4,5,6,and7) - 60 ... 87.0%

C - Eating places and other services (groups 8 and 9) - 17.. 39.5%

D - Hardware,Building materialsshops and others (groups No .10 and 11) - Nil

E - Administrative - 1 .... 16.7%

F - Social Services - 2 .... 18.2%

Within each linear zone mapped in (Fig 9.1) the proportion of establishments, classified as in (Table 9.1) and located in 'main street' zones can be summarily presented as follows:

Groups	Dammam	Al-Khobar	Hofuf	Qatif
A	34.2%	47.9%	34.4%	35.9%
B	81.6%	56.7%	79.4%	50.0%
C	64.0%	60.7%	40.0%	31.3%
D	78.4%	23.1%	18.9%	38.9%
E	63.0%	25.9%	31.4%	50.0%
F	54.8%	18.1%	54.1%	50.0%

In three out of four of the case-study settlements we find considerable uniformity in the proportion of food shops Group A in Table 9.1 in the main street zone, i.e. 34.2%-35.9%. As can be seen from Figs.(8.24,856 and 8.70) foodshops which include many low-order convenience retail outlets tend to be dispersed throughout the residential areas although their density of distribution increases towards the central zone. Specialised shops of a higher order B are much more heavily concentrated in the central zones but the degree of concentration differs from settlement to settlement. Dammam, the second largest town and with the largest number of such shops has the highest degree of concentration and a similar ranking town in population. Hofuf, has the next highest such concentration; Hofuf as we shall see has also a special inter-urban spatial ranking which would appear to be correlated with its high internal specialised shopping concentration. Al-Khobar has an exceptionally low central concentration of specialised shops a fact which can only be explained by (a) the existence in Al-Thugbah, a separate residential area, of a large number - 60 - of such shops in the sub-centre noted on (pp.346-347) and (b) the inter-urban spatial dominance of Dammam. Qatif's apparently low central concentration of specialised shops on the main street (50%) results in part from the presence on Sharria Street just off the main street frontage of a further 25% of the small total number of such shops (see Fig.8.38).

Group C establishments, restaurants, hairdressers and some other personal and technical services also have varying degrees of main street concentration. It was not possible during this research to rank such establishments by turnover or other criteria but in general we can note that the number of restaurants and photographers and mens hairdressers is far greater in Dammam and Al-Khobar than their population ranking compared with other settlements. This fact is associated with the higher disposable incomes of the populations of these two towns (as indicated by occupations) and the degree of main street concentration

of group C establishments is associated with multi-purpose journeys to the central places of Dammam and Hofuf not only by the high income discrete populations of the two but also by parts of the populations of the other settlements. It is notable that group C central concentration is far lower in Hofuf and Qatif both of which immediately serve populations with large rural components, and which have relatively low order administrative functions and therefore attract fewer multi-purpose journeys.

Dammam stands out as having a very high central zone concentration of group D establishments and all the other towns have low such concentrations. In Dammam this results from the very large proportion of warehouses, building materials suppliers and motor spare parts establishments found in the central zone. As pointed out by J.I.Clarke and B.D.Clark in "Kermanshah"[15] pp.79-85 it is not altogether easy to isolate and identify exactly the detailed functions served by such establishments. As in Kermanshah, some warehouses and suppliers of building materials have remained located in or near the suq area i.e.King Faisal Street. In addition, to the inertia factor however we can also note that the construction boom, particularly in housing, which has gone on in Dammam for the last twenty years and is still accelerating has resulted in very complex practices of the purchasing of building materials. It is, from personal knowledge, very common for a client to purchase himself a great range of building fittings and supply them to the builder. Motor spares are also generally the vehicle owner's responsiblity for purchase and supply to the mechanic or fitter. For many purposes, therefore, establishments in group D may be regarded as specialised shops supplying individual consumers, rather than mainly catering in a wholesale capacity to other trades. Further analysis can only be made on the basis of a different kind of study of urban commerical activities than has been possible in this thesis.

Group F, the social services, as noted in the conclusion to Chapter 4, cannot with any accuracy be fitted into any model of urban internal space location since none of the standard factors such as travel-minimising were utilised in the locating decisions.

Lastly group E. Dammam, already noted as being the top of the urban administrative function hierarchy conforms to a model in which the administrative functions are also the most highly concentrated within any settlement.

In all therefore we can observe, even in this small sample of settlements and even in a rapidly changing situation, orders or hierarchies of service centres within towns, very much in line with the concepts developed by Berry and Garrison, these hierarchies being spatial as well as functional.

Before we proceed to a final spatial hierarchy of urban settlements, however, it is necessary to outline the facts of industrial location.

In Chapter 6 we noted that 62.9% of the Eastern Province's industrial establishments are located in the city centres of Dammam,Al-Khobar and Hofuf (see Tables 8.15; 8.31; 8.46 and 8.64). These are the small workshops rather than factories and while by classification each has five or more workers (including owner(s) or employer(s'), they are very small and as noted on (pp.173-75) provide relatively simple processing services, e.g. electrical repairs, joinery, etc. Their central urban location is similar to that recorded in Hong Kong[16] and Kermanshah[17].

This type of household industry at the moment is flourishing in the Eastern Province towns but with the rapid rise in central urban land prices (known from personal observation but not recorded in any data, official or otherwise) can be expected to decline in the urban centres in the future.

More important in a Provinces spatial analysis is factory industry. In Chapter 6 and in the case-studies presented in Chapter 8, we see that 25.7% of all establishments are situated on the Midland region road

network (with the exception at Hofuf of one cement-factory, one date packing factory and a small traditional clothing factory, and the Abqaiq sulphur extraction plant); all others lie on the Dammam industrial estate.

The high degree of concentration of factory industry in the Midland region is illustrated in (Fig.6.11).

What are the reasons for this? Firstly, there has been clearly a minimising of transport costs. All the basic processing of oil and natural gas takes place on or as near as is feasible to the points of oil and gas extraction, and therefore supply of raw materials, e.g. the Petromin sulphur, ammonia fertilisers and sulphuric acid plants. The energy used, gas, is available on the same sites. These existing industries lie in the 'central' oldest oil field which in terms of cost-distance is also nearest to the only port, Dammam, through which other material inputs - capital equipment, process catalysts, refined products, etc. - can come. The other oilfields in the south, e.g.Harmaliya, can only offer industry basic energy and hydro- carbon raw materials; all other inputs would have to be transported high cost distances if industries were to be established on them. It is far cheaper to transport the crude oil to the established centres at Ras Tannura and Dammam. Even at Jubail, the industrial development plans entail the construction of a new import facility, i.e. a seaport. For other industries, i.e.engineering, factory scale food processing, etc.,transport cost minimising operates through the need for locating, other things being equal, as near as possible to the point of entry of the imports of almost all commodity inputs, i.e. Dammam. Sea transport costs are relatively low so that prices of imported inputs have a low transport charge but all further handling and land transport charges impose high costs. Non coastal locations - and this effectively means everywhere more than 10 kilometres from the only effective port - are thus at a cost disadvantage.

Secondly, there is the matter of income maximisation through market

location of industry. In the case of industries which supply other industries, e.g. engineering, paper, glass, etc., the maximum market penetration is achieved by locating near existing industries. This is in fact what happened in the early stages when the oil extraction industry centred at Dhahran was the market for the first group of engineering and contracting suppliers and the agglomeration advantage has accummulated along the lines suggested by Hirshman[18]. While this is also in part a matter of transport costs minimising there is also involved the other elements of the dominance by any centre of economic activity once it is created as noted by Bogue.[19] Moreover, now Perroux's 'propulsive unit' concept[20] can be not only functionally but spatially identified - the basic oil extraction and export industry, as fixing the nucleus for any agglomeration. The absence of any previous economic activity in the Eastern Province other than traditional agriculture and pastoralism, small scale fishing and small scale trade, mainly in agricultural products, made it possible for the demands and oppurtunities, offered by the rapidly growing and very large basic oil industry to dominate the industrial scene functionally and spatially. The highly centralised agglomeration process also had the negative effect of affecting the pre-existing main population clusters of Al-Hasa and Qatif only to a very minor extent and that clearly correlated with cost-distance from the new nucleus. Qatif then merely became a neighbouring peripheral areal and Hofuf as a distant peripheral area had to await the 'trickle-down' effect as described by Hirshman[21] of the widening activities in the Midland region, apart from its loss by emigration of population to the Midland region. Now, we also have to note a further factor, that of government intervention by which the costs of locating away from the market complex are met not directly by freely competitive industry but in part by subsidies in one form or another. For example, the cement factory at Hofuf not only had 80% of its capital supplied by the State but its operations are guaranteed by the State so that cost-efficiency in location is subordinated to social

policy. As the government of Saudi Arabia develops further public sector industrial involvement, so purely commercial factors of location can become less important.

Those manufacturing industries whose end-products go directly or almost directly (through retail outlets) to individual consumers have been similarly affected by locational factors. The Midland region has the highest concentration of relatively high disposable incomes creating the dominant market for everything from locally made bricks and tiles to clothing and confectionery made from imported raw materials. The external flows are almost entirely of materials imported through Dammam; the consumer market is concentrated within a radius of 18 kilometres from the port.

The location of manufacturing in this way reinforces the spatial hierarchy of service (including administrative) functions. The result is a very strong association of urban centres and in particular one urban region with industrial concentration. Maximum profitability and convenience have so far been obtained by this concentration. Some present and possible future planned trends however indicate that other more complex planning criteria are becoming more important.

For example, until 1970 Dammam as the only significant important channel for imports was in cost-distance terms very near to groundwater and energy supplies. Now, groundwater supplies are insufficient but it is present Saudi Arabian policy in any case to allow industrial development only to take place in coastal locations where sea-water desalination can be carried out at minimum cost of sea-water transportation.

This policy in no way adversely affects the dominance of the existing Midland region but places inland centres such as Hofuf at a further disadvantage. On the other hand, as part of regional policy, the government financially encourages the decentralisation of some activities including some industries such as food processing in locations away from the main domestic markets and even where spare trained labour supply may not be plentiful even though there is some agricultural under-employment as at Al Hasa and Qatif.

In this chapter I have attempted to demonstrate some of the ways in which spatial models and concepts can be used in order to improve our understanding of the Eastern Province and in particular of urban settlements. The great shortage of data and the impossibility of obtaining all the possible data required by personal survey together limit the degree to which such analysis can be made. The urban sample is itself necessarily small. What we can note is that for some limited purposes at least these spatial and geographical approaches help to some extent our understanding of the processes involved.

In Chapter 10, the findings of the preceding work are summarised and a tentative model of space-relationships within the area of study is presented.

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CHAPTER TEN

CONCLUSION

The Eastern Province has been influenced perhaps more than many other provinces in Saudi Arabia, by a complex of factors which have played an important role in the growth and development of its urban settlements. The major factors can be grouped as follows:

A. Physical

B. Cultural

C. Economic

The physical factors have remained, with one important exception, constant, while the other two are variable, both integral to each other and inseparable, and greatly affected by past cultures prevalent in the Eastern Province.

A. The Physical Factor

1. Geology

The geological structure of the Eastern Province has played an important role in its development, especially since the discovery of oil in 1938, which brought with it important changes in the economy of the province.

The most important development was that the region evolved from a centuries old agricultural economy to an oil-based industrial economy. The face of the region has changed dramatically, with the establishment of industrial units of all types, which have created a new type of economy. Some examples of the changes which have been affected are given below:

(a) the emigration of the younger population from agricultural areas to industrial urban settlements seeking higher wages and a better standard of living, this causing a rapid decline in agricultural production;

(b) The agricultural economy has become of secondary importance, and the area of land under cultivation has decreased, partly due to emigration from countryside (see chapter 4 pp.118-119). The hydro-geological conditions which allowed the creation of the oases of Qatif and Al-Hasa remain but the oases and their settlments have suffered a period of decline.

(c) The population demanded a more varied type of agricultural produce; prior to the discovery of oil, dates had been a major part of their diet now they demanded a much wider variety of vegetables and fruit, in keeping with their improved lifestyle and economic pattern. This brought about a decline in the date production and a switch to the more profitable fruit and vegetable farming; this in turn has led recently to large scale technical investment in the old oasis areas, but there remains a labour shortage.

2. Topography

The topography of the Eastern Province is characterised by a vast plain, the only relief being in the form of small groups of hills. These flat plains proved an enormous advantage or at least not proved disadvantageous in past and present decades, enabling settlements to be easily and relatively cheaply linked by road and rail. Throughout history, the Eastern Province was extremely important as a link between the Arabian Peninsula and the countries further east; thus Hofuf was a commercial centre for the region and also for the peninsula . Now Dammam, well-connected with Najid, is one of the major supply points for the whole of Arabia.

Topographically the Eastern Province settlements were influenced by several factors.

The great sand deserts of Dahna west, Jafura to the south-east and Rub Al-Khali in the south, had an important influence in concentrating settlements in some particular areas, such as the coast and the oases. The sands have even affected those settlements in the less hostile areas where many villages, particularly in the Oasis of Al-Hasa, were buried under moving sands.

The Sabkhahs also form negative areas within the coastal urban areas, particularly in Qatif Oasis. These sabkhat have affected the development of settlements and also the cultivated areas, since salinity and mechanical instability prevent land from being used either for growing crops or

building purposes. For this reason the cement factory at Hofuf has produced a type of cement incorporating this salty sand.

3. Climate

Another physical factor affecting the province, is its climate, characterised by high temperatures, humidity, amount of rainfall and wind direction. The effects of these physical aspects can be outlined as follows. The hot humid summers and very cold winters have an important influence on the type of building materials which can be used, and this in turn affects the types of buildings which can be constructed, both on the coast and in inland areas.

Rainfall is very sparse, except for a few months of the year, when a few millimetres of rain are recorded, resulting in vast areas of sand and desert. Water supply, either from groundwater or now from desalination remains a critical factor for all types of human activity.

These climatic factors have had a drastic effect on the economy of the Eastern Province, and crops can only be grown in oasis areas where there is a relative abundance of water. Also, the quality of livestock in the region remained poor, and it is for this reason that the government established the Haradh Project, to improve the quality of livestock and supply of animal products in the Province.

B. The Cultural Factor

This is a variable factor affecting regional development, and can be sub-divided under the following headings: historical, standard of living; human activities and religion.

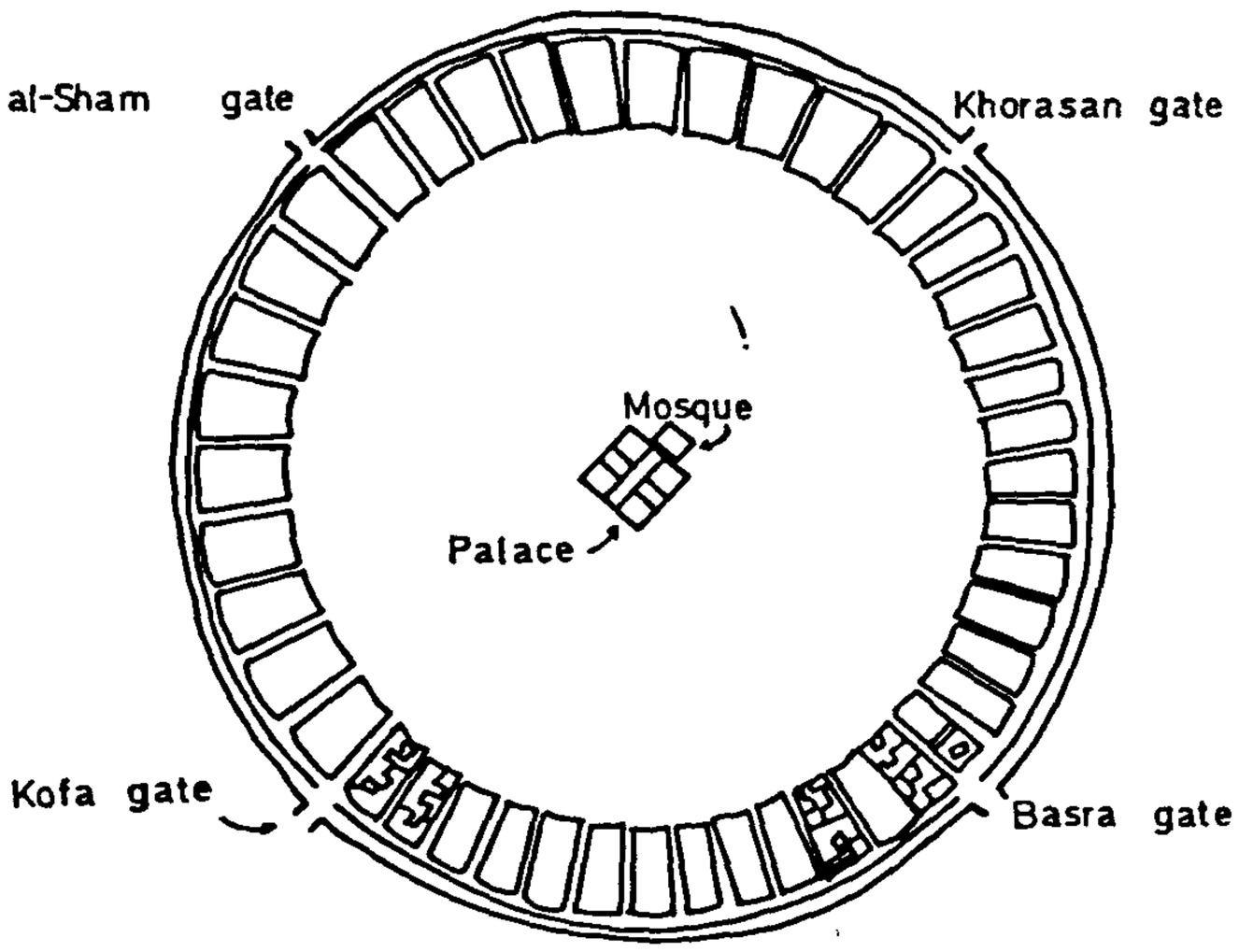
(a) Historical

In the history of the Eastern Province we see many changes in geo-politics and civilisations, from the Karmathian period to the present day. The civilisation of the Eastern Province has been greatly influenced by each of these stages in history, when its population has inter-mingled with other races through wars, commercial trading and even by virtue of its location with regard to neighbouring countries. This intermingling has resulted in

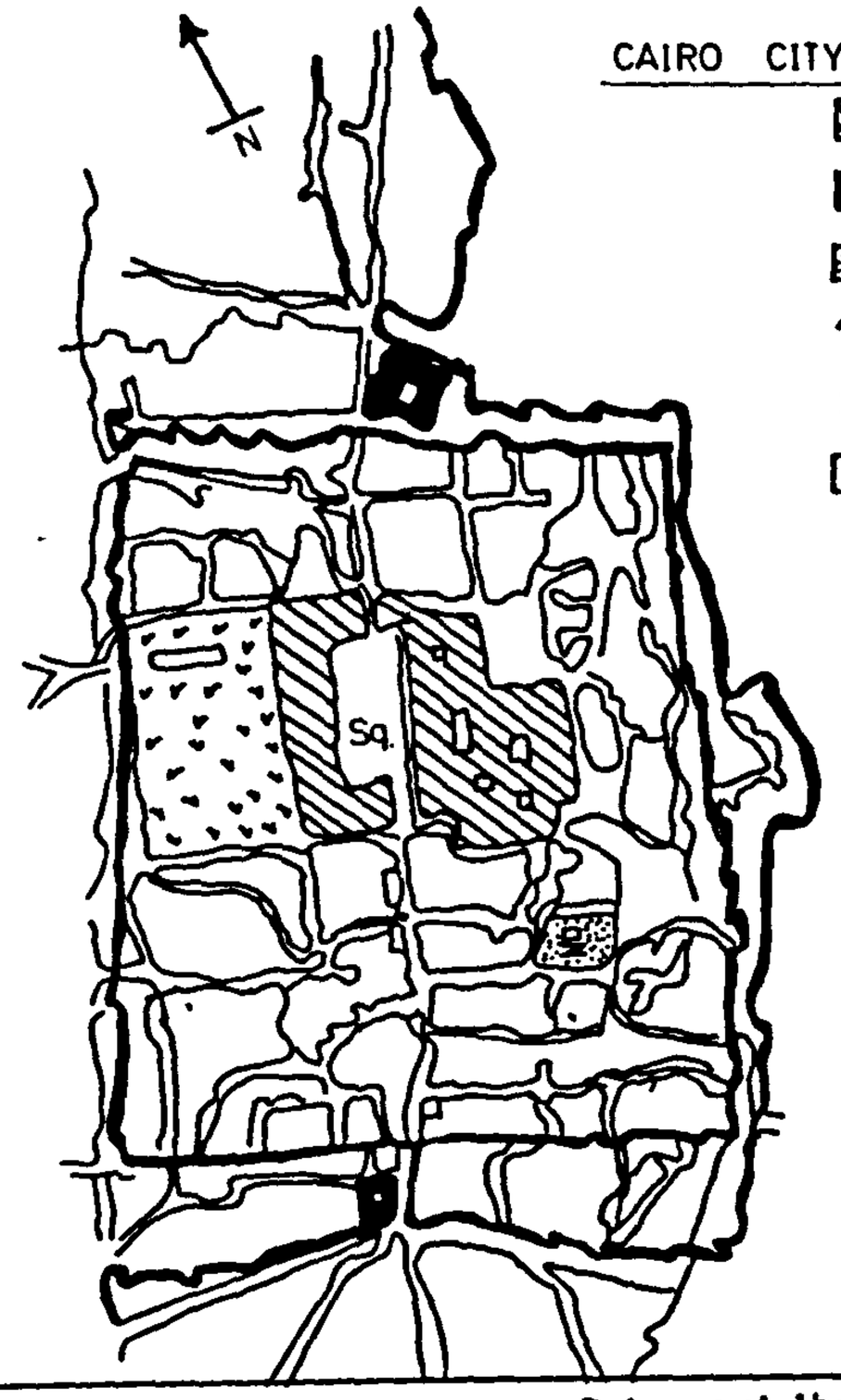
special racial characteristics, with the Persian and Indian influence being evident in the people of the whole province, the Persian strain being more predominant around Qatif Oasis. This also explains the close religious relationships of the Shi'ah with Persia. More recent influences and their effects on the development of the people of the province are hard to assess, as it is too early to say what the face of the future will be, but the strength of immigration from India and Pakistan is growing, this especially important in the towns.

The effects from an economic point of view are however, very clear. Many important changes have taken place since the discovery of oil in urban development, town planning and the lifestyle of the people. In former eras, the Greek culture affected democracy of rule and equality of cities; the Mansour culture of Baghdad in Iraq many centuries ago brought about centralisation of rule, with a limited amount of freedom in city planning for each individual quarter; the influence of Cairo (Kahir) is also evident at the beginning of the Islamic period, where the rulers built their private cities within the larger mother city, and surrounded them with defence walls. In the centre of this walled inner city the rulers built their mosque and palace and surrounded them with other private buildings. (See Fig.10.1)[1] This type of 'inner city' is evident in the plans of the old cities of Hofuf and Qatif. In Hofuf the old quarter of Al-Kut was surrounded by fortress walls, and in the middle of this quarter were found the mosque and the palace of the governor of Al-Hasa region; the whole of the old Hofuf city was surrounded by other fortress walls. A similar pattern is seen in Qatif, where the Qal'ah quarter was a private city of the ruler of Qatif region. The plans of both Hofuf and Qatif show the political influence of that time (see Chapter 8, section A. Fig.8.14 and also see Fig.10.2).

Present day cultural effects are strongly in evidence in the structure and planning of the new settlements and developments. These modern developments are the result of economic rather than political changes due to industrialisation in the Eastern Province, eg. Dhahran, Abqaiq, Ras Tannura have been adapted to cope with their special functions as central towns of



THE CIRCLE PRIVATE CITY OF AL-MANSOUR IN IRAQ. (after Krizwel)



CAIRO CITY (al-QAHIRA)

- The two palaces.
- Mosques.
- al-Azhir mosque.
- Fortress wall.
- Sq. Square.
- Garden.

THE CITY BUILDINGS SURROUNDING THE TWO PALACES OF AL-KALIFA AND NOT THE MOSQUE.

Reference: A. Ibrahim (1968) al-Turath al Hadhari in the arab city)

FIG. 10.1

Element:

--- Al-Qal'ah Quarter (walled).

A - Governor's Residence and fort.

B - Chief Mosque.

. Suq Al-Khamis.

FIG.10.2. QATIF TRADITIONAL URBAN.

the oil industry. In Dhahran in particular, the centre of the oil industry, this small private town is different in design to the other quarters of Dhahran, and comprises a separate fenced settlement in the American pattern. (See Chapter 8, Section E, Fig.8.81). A similar pattern of design for these settlements is also seen in Abqaiq and Ras Tannura, as the American influence is very strong in these towns. The other new settlements not directly serving the oil companies, eg. Dammam and Al-Khobar, are nevertheless influenced in design and planning by Aramco introduced planning concepts and by new economic functionalism as compared with cities such as Hofuf and Qatif.

(b) Standards of Living

These are important because changes in these reflect demands made on the urban settlements by their inhabitants. Difficult to measure directly in a period of rapid change, the standard of living is indirectly indicated by the educational level of the population, and this factor is dependent on the economic standards of different sections of the population. Educational levels are usually based on individual income level, and this can be used as a base for assessing and comparing the different standards of living among the population. This type of assessment is much easier in countries where the standard of living is more equal.

In the Eastern Province there is a wide diversity in the range of levels of education, as a result of the wide range of income groups of Dammam and Al-Khobar, the new major cities. Most of the inhabitants of these two cities are immigrants who had come from a variety of societies, both in the Arabian Peninsual, Arab counties and other nations. Each group had a wide range of educational levels and some were uneducated, making it difficult to measure the 'standard' of living in the province (see Table 10.1 showing the levels of education in two major cities (Dammam and Al-Khobar) in the Eastern Province Survey Sample from personal fieldwork in 1973). The standards of both education and living have improved since the advent of oil, particularly over the past few years, and the consequent effects on housing needs, needs for public utilities and services are appearing rapidly but in a confused fashion.

TABLE 10.1

DIFFERENCES IN LEVELS OF EDUCATION, SURVEY SAMPLE 1973

Educational Level	Dammam		Al-Khobar		Total	
	No.	%	No.	%	No.	%
Higher Degree	-	-	3	0.2	3	0.1
Graduate	138	7.6	95	5.9	233	6.8
Secondary	202	11.1	179	11.1	381	11.1
Intermediate	437	24.0	235	14.1	672	19.6
Elementary	337	18.5	297	18.4	634	18.5
Read and write	257	14.1	411	25.4	668	19.5
Illiterate	399	21.9	325	20.1	724	21.1
Unknown	48	2.6	70	4.3	118	3.4
TOTALS	1818	100	1615	100	3433	100

Source: Personal Fieldwork 1973

(c) Human Activities

The educational level of the population and economic development within different cities have a direct relationship to involvement in industrial, commercial, political, administrative and other activities of the people, and both factors have certainly been influenced by the improved economy of the country, especially in the Eastern Province. Prior to the discovery of oil, the region was important as an agricultural area, and most of the inhabitants were farmers or merchants of agricultural produce. As a result, the emphasis was primarily on experience-gained agricultural education. Oil revenues and the creation of more employment opportunities changed the economy from agricultural to industrial, and this in turn affected the commercial activities of the region. The aim of education is now more varied, and based on commercial and industrial, as well as agricultural needs.

Here we find the government-run industrial schools, and the Aramco Industrial Training Centre. The Petroleum University, a product of the recent economic changes, is also located in Dhahran; formerly one single college, and now a complex of several colleges catering for all aspects of the development of industrial education. Thus the 'golden triangle'

made up of Dammam, Al-Khobar and Dhahran, constitutes the central area of urban activity in the region, and the populations of other urban areas are linked with these cities by fast, modern forms of transport and communications.

(d) Religion

In Christian cities the cathedral or church played an important role in settled communities, as they were key centres of social life; the same was true of the mosque in Islamic cities, where people gathered five times daily for prayer, and where the ruler received his homage from his people. Also the mosque was the main source of education where instruction in the Koran and Islamic tradition were given. In past centuries the mosque was the centre of the city and was surrounded by the crowded residential, commercial and artisan quarters, and the square in front of the mosque was the site of itinerant dealers who crowded there after Friday prayers. The mosque now plays a less significant part in the plan of most Islamic cities; the permanent commercial centres are on the wider main streets of the cities; Islamic cities have become enlarged and developed and more mosques have been built, and as the commercial activities have become segregated the central mosque remains only as a centre for prayer and for special occasions. In some cities however the religious and commercial activities remain almost inseparable, eg Dammam, where the main Friday mosque is located in the city centre, and is surrounded by permanent shops and covered markets. The picture in Al-Khobar is totally different and the mosque here is not the central focal point in the planned city. In Al-Khobar the major factors affecting city planning were first of all its position and second its function as a commercial centre for the employees of the oil companies resident in Dhahran. In the case of the old cities of Hofuf and Qatif, the mosque factor had even less direct effect, as it was built within the private fortress of the governor (Al-Kut in Hofuf, and Al-Qal'ah in Qatif), whereas all the activities of the population were

concentrated outside, eg the Suq Al-Khamis the main gathering centre in both cities, is outside, to the east of the private city in Hofuf and to its west in Qatif, and neither suq is located near the mosque. Suq Al-Khamis is now the main shopping centre in the modern cities of both Hofuf and Qatif.

C. The Economic Factor

Recently this has become the main factor influencing the location and growth of towns in the Eastern Province. Formerly the formation of towns in Arabia was governed by the position of water (wells or springs), the suitability of the land for cultivation, the caravan routes and roads, and the location of coastal ports for trading purposes. In the case of Hofuf, Mubarraz and Qatif the major influence was the availability of water. The oases of Al-Hasa and Qatif were famous for their abundant water springs, and good farming land; as they were also located on the east-west trans-peninsular trading route they became the main settlement areas in the east of the Arabian Peninsula . Hofuf, Mubarraz and Qatif were the largest settlement centres and were surrounded by other smaller settlements. The coastal settlements such as Uqair and Jubail situated on the Gulf were the chief ports of the Eastern Province and other smaller coastal settlements played a minor role as fishing hamlets, and at that time, Dammam and Al-Khobar came into this category.

The newer settlements, founded since the discovery of oil in the region, were created to fulfill the demand for residential areas near the industrial zone, and their location was not governed by the availability of water, or any other single natural factor. Dammam, Al-Khobar, Dhahran, Abqaiq, Ras Tannura, Rihaimah, Al-Udhiylia are all examples of such settlements. In its earlier stages of development water was carried to Al-Khobar from wells in Al-Thuqbah, 4Km inland, to supply the needs of the employees of the oil companies. A more recent development has been the establishing of a distillation plant, south of Al-Khobar, for the

desalinisation and sweetening of sea water, to supply Dammam, Al-Khobar Dhahran, Qatif and other settlements which have no suitable drinking water but an abundance of salty water.

In earlier chapters the new factors affecting the recently established urban settlements as well as the old, ie transport and communications, industrialisation, services and utilities, were examined. Everywhere there is apparent change, regionally varied and only just beginning. Within the next few years the new port and industrial complex of Jubail will add another piece to the changing mosaic. At this time one can only outline the characteristics of urban settlement during a first phase of change.

In the individual studies of urban settlement the same is true. The historical morphology can be sketched but no town has yet reached maturity. However, even with the small amount of data that is available and that which could be obtained in the course of this research, it is possible to identify some processes of urbanisation and some features such as varied specialisation, hierarchical patterns and urban regions. On this basis of urban geography we can arrive at some understanding of the urban settlements which are in the course of evolution. Nevertheless, as this study shows and recent events suggest, almost all urban evolution in the Eastern Province is very recent, and present and future changes are rapid and could be extreme in character. In another twenty years the newer towns will only be twice as old as they are now but the impact of national economic planning on them could be even greater than in the first twenty years. This is especially difficult to forecast in terms of population mobility, demand for labour and immigration. It is estimated, for example, that a labour force of 20,000 will be needed for the construction phase only of the Jubail complex!

In this thesis, using what published data exists and the data collected in personal survey, we commenced at the Provincial scale

in Chapters 1 to 7. Here were described the facts and the processes most significant from the point of view of human settlements in the Province as a whole but also noted some sub-regional characteristics. In Chapter 8 we examined the morphology, functional characteristics and processes of change in detail within five case-study settlements. On the basis of all this evidence, in Chapter 9 some studies in spatial analysis were made at the internal urban level and at inter urban level. Here in conclusion a tentative model combining functional and spatial factors is presented as a summing up of the pattern of settlement and human activity within that area of the Eastern Province.

Fig.10.3 is adapted from model presented by J.R.P.Friedman in 1956[2] (see also Hurst (p.323, Fig.204), and is based on the data earlier presented (see also Figs.4.7 and 6.11). In the spatial hierarchy, the highest order is given the title "Provincial", referring to the Eastern Province, and the next highest entitled "Regional", for reasons which will appear.

Dammam appears as a single urban settlement with the greatest range of significant functions, i e.administration, manufacturing, distributive and other services, transport and residence. (see Chapter 8 Section F pp 382-86 and Chapter 9). Dammam is the single highest order centre and which serves the greatest area and is here ranked as the Provincial City.

However, as noted in Chapter 4,pp 85 and 86 Dammam is also part of a region which can legitimately be described as a conurbation. Within this Dhahran and Al-Khobar may be regarded as lower order centres (see, for example, Table 8.4 and Chapter 9 pp 388-98) with a high degree of dependency on Dammam. Nevertheless, Dhahran and Al-Khobar, because of their specialised functions, the former as the technical and administrative headquarters of the oil company - the original propulsive unit, the latter because of its dominance in the highest order of retailing, add some functions which are relatively weaker in Dammam to make an urban region.

The addition of other activities which are not centred on single towns,e.g. manufacturing industries (see Chapter 6 pp.161-170) and the airport (see Chapter 7 pp.190-191), converts an urban region into an economic region, which as the result of the continuing infill by buildings of all kinds of the area which lies between Dammam, Al-Khobar and Dhahran is also a conurbation. This is the 'golden triangle' which as a whole dominates the life of the Province even more than does Dammam. Within it lie development axes elongated along the principal road routes linking the three towns and extending along the route from the region towards Riyadh and central Saudi Arabia.

The golden triangle or the Midland region - Dammam, Al-Khobar and Dhahran - stands out as the main urban area in the Eastern Province; within it Dammam and Al-Khobar have the largest urban centre functions. This central conurbation (Chapter 4 pp.85-86) contains the most important elements of industry, commerce and administration in the region; each of the three settlements with their hinterlands constitute "growth poles" which coalesce to form a region of great potential.

Outside this dominant economic region, other centres and regions can be identified. Within 20 kilometres distance to the north lies Qatif and its associated oasis settlements and neighbouring Ras-Tannura. As noted in (Chapter 8 Section B pp.253-279 and F and Chapter 9 pp.394-398). Qatif is the functional hierarchial head of the oasis region and as such qualifies to be termed a regional city. However, Ras Tannura as a very specialised centre with oil refinery industry and oil terminal services has only partial linkages with Qatif, i.e. the place of work for many residents of Qatif, but Qatif does not serve as a service centre for Ras Tannura in the way that Dammam and Al-Khobar serve as service centres for Dhahran. The relative strengths of these linkages are indicated in Fig.10.3. Moreover, the physical expansion of the Midland conurbation and economic region towards Qatif suggests that the already weak regional autonomy of Qatif may give way to minor and totally subordinate status within a larger dominant economic region. The only regional individuality is associated with the non-urban

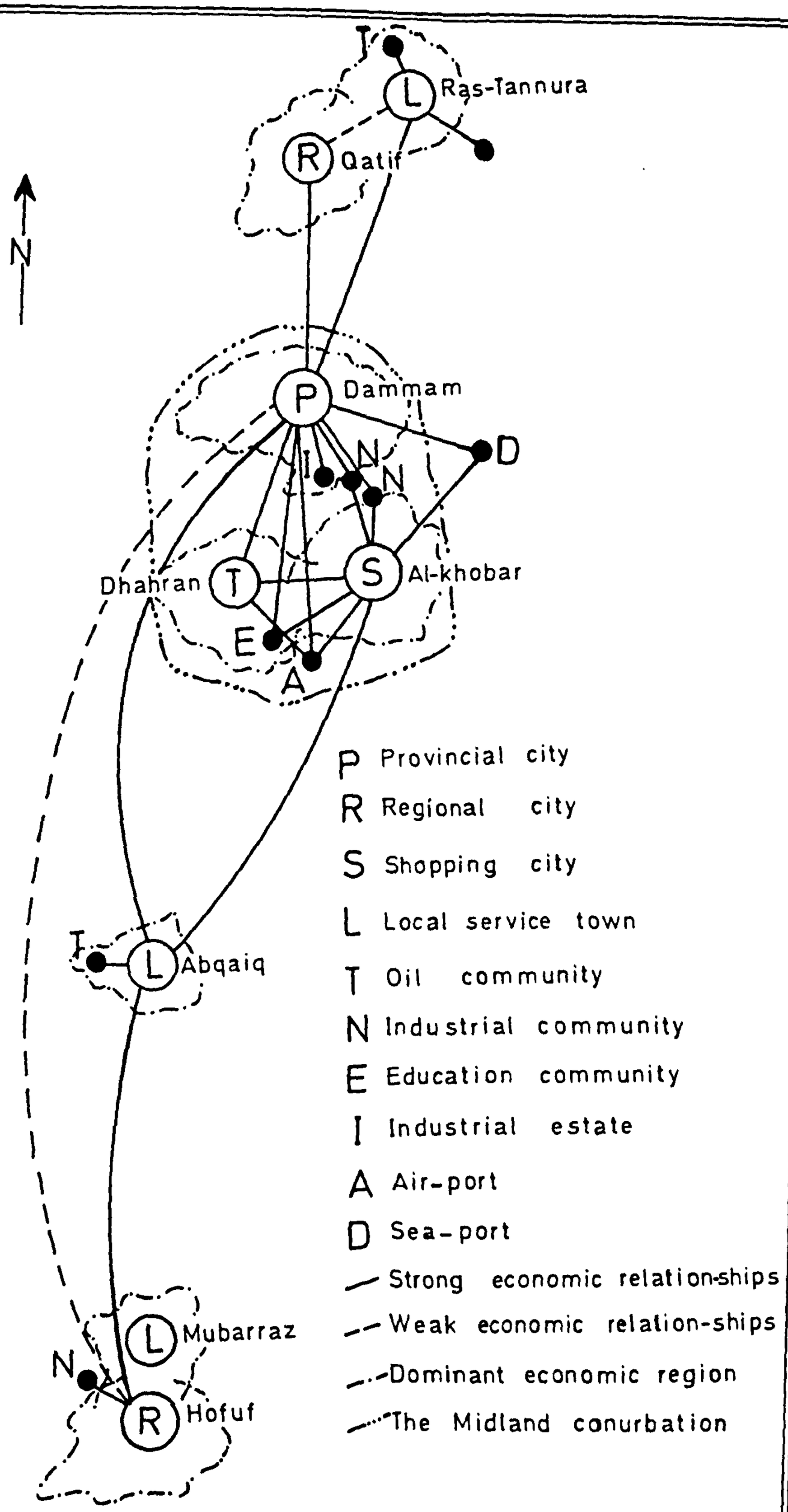


FIG. 10.3. THE EASTERN PROVINCE SCHEMATIC MODEL OF ECONOMIC SPATIAL RELATION-SHIPS OF TOWNS AND REGIONS.

oasis forming populations.

170 kilometres distant from the "golden triangle" lie Hofuf and the Al-Hasa economic region, separated from the Midland region by completly negative unbroken desert (except for Abquaiq - see below). The large size of the cultivated oases and the associated large number of small settlements make this settlement cluster an economic region with strong elements of independence. The dominance of small scale agriculture (see Chapter 3 pp.36-39) results in a numerically large population having proportionately a much lower disposable income than is found in the Midland region. Partly for this reason, Hofuf, while providing regional, centre functions, with Mubarraz acting as a sub-regional lower order centre, has not developed activities - manufacturing or service - of as high an order as could have been expected from population size (see Chapter 8 section F). However, unlike Qatif, the cost-distance threshold between Hofuf and the Midland conurbation is sufficiently high to maintain some considerable autonomy even at the administrative level (see Chapter 9 pp.387-388). It may also be regarded for some purposes as a sub-Provincial city. The linkages between Hofuf as a regional city (and Al Hasa as a definable economic region although as noted on pp 87 and 88 with limited claims to be regarded as an urbanised area) with the dominant Midland economic region are strong at the level of Provincial services but otherwise weak.

There remains one other settlement which, because of time limitations could not be included in the selection of case-studies, Abqaiq.

The oil town of Abqaiq, which has been built since 1958 in the desert on the road between Dammam and Hofuf serves solely the local residents in the town itself and the oil community. The population of Abqaiq can go north to Dammam for all Provincial level services and to Dammam and Al-Khobar for the widest range of lower level services, or south to Hofuf for a smaller but still wide choice of goods and services. Abqaiq comes second to Dhahran in the administrative structure of the oil industry and lies on what is now the most important oil field in the Eastern Province. Here in Abqaiq there are very few other administrative offices, but it is

provided with schools and some other social facilities purely to meet local demand. This town was developed by the oil industry and is potentially the nucleus for a new cluster in the desert. As Table 4.21 indicates it ranked seventh in population size of towns in the Eastern Province in 1962/63 and although larger than Dhahran it was barely more than one quarter of the size of Dammam. Abqaiq was not studied in detail for this research and no later population figures have been obtainable. However, observations made during visits in 1971 of the scale and type of physical expansion indicate an acceleration of growth both in the new company cantonment (similar to Dhahran) and in the neighbouring residential area occupied by local employees and other people employed in the growing number of service functions - retail, schools etc. Abqaiq has only one factory industry - sulphur extraction from crude oil - but is the only specialised oil industry town also to have a growing non-oil urban sector. As such, it is beginning to play a significant economic and settlement role in our region of study but the level of its development will depend on the strength of its linkages with the dominant Midland economic region and with the autonomous oasis region of Al Hasa. Only 80 Kilometres separate Abqaiq from the 'golden triangle' of Dammam, Al-Khobar and Dhahran and while this is large enough to preventits physical incorporation in the Midland conurbation the cost-distance provides a low threshold for travel to the conurbation for services. Since also both seaport for external transport and airport for external and internal scheduled flights lie within the conurbation, and the oil company headquarters in Dhahran is similarly located, it does not seem likely that Abqaiq will develop more than local region functions.

This model together with the analysis earlior presented illustrate the dynamics of the settlement geography of the Eastern Province of Saudi Arabia. Many of the recently developed concepts of geographical spatial analysis can be seen in this first study of this kind in this area to help

in our understanding of the existing patterns and the underlying processes. Further studies it is hoped will be able to draw on fuller published data and to extend the range of settlements studied; they will be made necessary by the very rapid speed of change in this region.

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APPENDIX I

QUESTIONNAIRE

I should be grateful for your co-operation in the completion of the simple questionnaire given below. The information is for economic and social purposes. Please fill in details in the spaces provided; where alternatives are given, please delete those which do not apply. Where numbers are given in spaces (eg 6,) please indicate the correct figure.

1. Personal data

I. Name _____ (Name need not be given if you do not wish)

_____

Originally from _____

At present living in _____

II. Religion: Muslim: Sunni; Hanbali; Shafiai, Other _____

Shiaih etc. (Entry may be made only as 'Moslem')

Education _____

Are you married or single? _____

How many children? Girls_____; Boys_____

How many people in your family? _____

2. Occupation

I. Type of work: clerk; teacher; officer; merchant; craftsman;

employee; other _____

Place of work: company office; government office; private office;

school; factory; store; coffee place; restaurant;

other _____

Department _____

II. Employer's address _____; Town _____

Are you wage-earning: Yes/No. Are you the owner of the business: Yes/No

Is your salary paid: monthly; weekly; daily

Salary in SR _____

If you are the owner, how much do you pay in total on average to

your employees per week _____; month _____;day _____

3. Housing

Town of residence _____

Type of Housing ---- _____ (eg villa, flat, room)

Type of construction _____ (eg mud, cement, block, bricks)

How many rooms in your house _____

Are you the owner or a tenant _____

If you are a tenant what is your rent? Monthly _____ Yearly _____

Is it difficult to obtain accommodation? Yes/No

Have you been trying to buy land in the city centre? Yes/No

Outside the centre? Yes/No. Outside the town? Yes/No

What is the price per square metre? _____

Is your home connected to the water system? Yes/No

Is your home connected to the sewage system? Yes/No

Is your home connected to the electricity supply? Yes/No

Is your home far from your work? Yes/No. The shopping centre? Yes/No

Schools: Yes/No. Hospitals: Yes/No

4. Transport

I. How do you travel to work? own car; taxi; bus; on foot; (please cross out those which do not apply).

If you own a car, do you find it difficult to park: at work;

when shopping; at home; (please cross out those which do not apply)

Have you any suggestions _____

If you do not own a car, do you have difficulty finding transport to:

your work; your home; shopping (suq); (please cross out those which do not apply).

Have you any suggestions for improving transport facilities in your town?

_____

II. How many times do you go shopping? per day _____; per week _____

per month _____; per year _____.

III. Do you often travel on business? Yes/No

Do you travel long or short distances _____

How many times? per day _____; per week _____; por month _____.

per year _____.

IV. What form of transport do you normally use?

bus; car; taxi; plane; other; _____

V. What town do you normally go to for shopping and business?

Dammam; Al-Khobar; Dhahran; Hofuf; Qatif; Riyadh;

Others: _____

If out of Saudi Arabia, state the countries you normally visit on business _____

5. Public Services

I. What type of services are found within your residential area and near your home: schools; hospitals; clinic; surgeries; mosques; post office; bank; suq; shopps (state type) ------
(Please cross out those which do not apply

II. What do you use mostly in your home: Gas; electricity; others _____
(Please cross out those which do not apply

Is this the cheapest and most economical form for you? Yes/No

6. Shopping

I. How do you buy your everyday requirements: from the nearest shop (suq);

State which _____

II. Do you prefer to buy your goods from retail shops or wholesale (bulk-sale) shops? _____

III. Where do you normally buy the following? (Give name of the shop and the street of its location).

Household appliances and electrical goods _____

Ladies', men's and children's clothes _____

Cloth _____

Ladies', men's and children's shoes _____

IV. How do you normally pay for goods: on terms _____; by cash _____

What type of goods do you prefer to pay for by cash? _____

on terms? _____

APPENDIX II

" استمارة حصر عينـــات "

لدراسة مدن المنطقة الشرقيـــــــة

اخى المواطن ، آمل ان تساعدنى فى ملء هذه الاستمارة بالاجابة الصحيحة لكل ســـــؤال والغرض الاساسى من ذلك هو دراسة اقتصادية واجتماعية فقط ، تتعلق بدراسة مدن المنطقـــة الشرقية ، التى اقوم باعدادها ٠٠ وذلك لمعرفة مدى النمو والتطور لهذه المدن ٠

اما الاسئلة فى هذه الاستمارة ٠٠ فليس فيها صعوبة عند الاجابة عليها ولا تتطلـب مـــن وقتك الا الشىء القليل ، واجابتك سوف تكون عبارة عن " نعم ٠ اولا " او ان تملأ بعض الفراغات مثل " ٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠ " باجابة قصيرة عبارة عن كلمة او كلمتين او ان تضع دائرة " ⊙ " على الكلمة او الكلمات التى تراها صحيحة لاجابتك ، وقد وضعتها لك لتختار منها الجـــواب الصحيح ٠٠٠ واخيرا هناك الاجابة التى تتطلب منك اعطاء ارقام معينة ، وقد وضعت لـــك مربعا [ ] تضع فيه الرقم المطلوب وهكذا ٠٠ وتاكد ان اجابتك وجميع البيانات التى تدلـى بها سوف تكون موضع عناية وتقدير وعدم السماح لاحد بالاطلاع عليها ٠٠ شاكرا لـك مقدمـــا تعاونك معـــي

المعلومات الشخصيـــة

١ ــ الاسم ٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠ " ملحوظه الاسم ليس ضرورى ذكره اذا كنت لا ترغب " ٠

٢ ــ العمر ٠٠٠٠٠٠٠٠٠٠٠٠٠٠ [ ] مكان الميلاد ٠٠٠٠٠٠٠٠٠٠

بلدك الاصلى ٠٠٠٠٠٠٠٠٠٠

البلد التى تقيم بها فى الوقت الحاضر ٠٠٠٠٠٠٠

٣ ــ الديانة والمذهب : اذكر ديانتك ومذهبك ٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠

٤ ــ الثقافة : مانوع ثقافتك ٠٠ هل هى ٠٠ ثقافة عامة دينية ، عامية ، اجتماعية ، تاريخيـــة ، الخ ٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠ وماهى مؤهلاتك ٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠

٥ ــ الحالة الاجتماعية : هل انت متزوج ، اعزب ٠٠ اذا كنت متزوج ٠٠ فما عدد اطفالك [ ] وماعدد الذكور [ ] وماعدد الاناث [ ] وماهو عمر الاكبر منهم [ ] وعمـــر الاصغـــر [ ]

٦ ــ كم عدد افراد اسرتك الذين تعولهم : الذكور منهم [ ] الاناث منهـــم [ ]
" ضع العدد فى داخل كل مربع " ٠

٧ ــ هل لديك احد تعوله غير زوجتك واطفالك : نعم ٠٠ لا ٠٠٠ اذا كان جوابك " بنعـــم " فما هى صلة القرابـــة ٠٠٠ ٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠٠ وكم عددهم [ ] ٠

" معلومات عن المهنـــــة "

١ ـ مانوع المهنة : هل انت موظف ، مدرس، عسكرى ، تاجر ، عامل ـ وهل انت عامل فى مصنـــــــع ورشه ، شركه ، عامل بناء ، واذكر نوع الشركة او المصنع او الورشة التى تعمل بها ـ اما اذا كنت تعمـــل فى اعمال اخرى فاذكرها ..... " ضع دائرة على الكلمة الموافقة " .

٢ ـ اين تعمل : هل فى مكتب حكومى ، شركة ، مكتب خاص، مدرسة ، مصنع ، مخزن او معرض، متجـــــر مقهى ، مطعم ، الخ ... اذا كان هناك مكان اخر انت تعمل فيه ولم يذكر هنـــا ..... فاذكره اذا سمحت " او ضع دائرة على الكلمة المناسبة " .

٣ ـ ماهو القسم الذى تعمل فيه ..... ؟

٤ ـ اين يكون مقر عملك : اذكر اسم البلد ..... واسم الشارع .....

٥ ـ هل انت تعمل باجر .. نعم .. لا .. فاذا كنت تعمل باجر .. فما هو راتبك الشهـــــرى [ ] او الاسبوعى [ ]

٦ ـ هل انت صاحب المحل ـ اى المالك له ـ نعم .. لا .. اذا كانت اجابتك بنعم ..... فما هـــو مجموع ماتدفعه تقريبا لعمالك او موظفيك شهريا [ ] او اسبوعيا [ ] او يوميا [ ]

٧ ـ هل لك دخل اخر غير دخلك من وظيفتك او عملك .. نعم .. لا .. ومامقداره .. [ ] ؟

٨ ـ كيف توزع راتبك او دخلك على مصروفاتك وحاجاتك المنزلية .....

فما مقدار ماتصرفه على المواد الغذائية [ ] والحاجات الضرورية [ ] والكماليات [ ] ومامقدار ماتوفره [ ] ؟ " ضع المقدار التقريبى لما تصرفه لكل نوع فمثلا $\frac{1}{4}$ الراتـــب او الدخل للمواد الغذائية .... الخ .

" معلومات عن السكن "

١ ـ اين مقر سكنك : فى الدمام ، الخبر ، الظهران ، القطيف ، الهفوف " ضع دائرة على المدينة الـــتى يقع فيها سكنك " اما اذا كنت تسكن فى مدينة اخرى لم يأتى ذكرها .. فاذكرها ....

٢ ـ مانوع السكن : فهل هو منزل عادى ، فله ، شقه ، غرفه " ضع دائرة على الكلمة الموافقة " .

٣ ـ مانوع مادة انشائه : فهل هى من الطين ، اسمنت مسلح ، بلكات ، اجور ، " ضع دائرة على الكلمة الموافقة " .

٤ ـ ماعدد الغرف فى مسكنك : " ضع العدد فى هذا المربع " [ ] ؟

٥ ـ ماعدد الحمامات فى مسكنك : " ضع العدد فى هذا المربع " [ ] وهل هى على الطـــراز الحديث ، القديم ، " ضع دائرة " .

٦ ـ هل انت المالك : نعم .. لا .. مستاجر .. نعم .. لا .. فاذا كنت مستاجر .. فكم تدفـــــع ايجارا لمسكنك شهريا [ ] سنويـــا [ ] ؟ .

٧ ـ هل هناك اية صعوبات عادفتك حين بحثت عن السكن ·· نعم ·· لا ·· ومانوع هـــــــــذه الصعوبات ····

٨ ـ هل اسهل عليك فى ان تستأجر ·· نعم ·· لا ·· او ان تشترى بيتا ·· نعم ·· لا ··· او ان تبيع بيتا ·· نعم ·· لا ···· ،

٩ ـ اى نوع من انواع السكن تفضل ان تسكن : بيت عادى ، فله ، شقـه ·

١٠ ـ هل تفضل ان تسكن داخل المدينة نعم ·· لا ·· خارج المدينة ·· نعم ·· لا ··· ولماذا ···· ؟

١١ ـ هل حاولت من قبل : فى ان تشترى قطعة من ارض، نعم ·· لا ··· وفى اى مكان هى ··· وسـط المدينة ·· او خارجها ·· وكم دفعت ثمنا للمتر المربع بالريال السعودى [ ] " ضـــع دائرة على كل كلمة موافقة وضع فى المستطيل ثمن المتر المربع " ·

١٢ ـ هل مسكنك موصل : بالماء ·· مجارى ·· الكهرباء ·· تلفون " ضع دائرة على الاشياء المتوفـــرة فى مسكنك " ·

١٣ ـ هل مسكنك قريب من مقر عملك ·· نعم ··· لا ··· ، قريب من السوق ·· نعم ·· لا ·· قريـــب من مدارس اطفالك ·· نعم ·· لا ·· ، قريب من المستشفى ·· نعم ·· لا ··· ،

" المواصـــــــلات "

١ ـ باى وسيلة من وسائل النقل فى البلد تذهب الى عملك : بسيارتك ·· بتكسى ·· حافلـــة ···· ماشيا على قدميك ·· " ضع دائرة على الكلمة الموافقة " واذكر عما اذا كنت تستعمل اى وسيلة اخـرى فى التنقـل ·

٢ ـ اذا كنت تملك سيارة : فهل انت تجد صعوبة فى الحصول على موقف ·· نعم ··· لا ·· واين فـى السوق عندما تريد ان تقضى حوائجك ، او فى قرب منزلك او عند عملك " ضع دائرة على الكلمات الموافقة " وماذا تقترحه للتغلب على مثل تلك الصعوبات التى تواجهك · ؟

اكتب اقتراحك هنا بايجاز ؟

٣ ـ اذا كنت لا تملك سيارة : هل تجد صعوبة فى التنقل ·· نعم ·· لا ·· وفى اى نوع من انواع النقـــل فى التكاسى ، الحافلات ·· او اى انواع اخرى اذكرها اذا سمحت·

وهل تجدها فى الذهاب الى عملك ، او فى الرجوع الى منزلك بعد العمل ، فى الذهاب الى السـوق وفى اى يوم من ايام الاسبوع ····· " اذكر اليوم " وفى اى فصل من فصول السنة فى الشتا ··· او الصيف ··· وماذا تقترحه لتحسين وسائل المواصلات فى بلدتك ·

اذا كان لديك اقتراح فاكتبه بايجاز : ·····

·····

٤ - ماعدد المرات التى تذهب بها الى السوق كل يوم كل اسبوع " ضع عـــدد المرات فى المربع " .

٥ - هل انت تسافر كثيرا من اجل متطلبات عملك .. نعم .. لا .. وهل لمسافات طويلـة ..... او قصيرة ..... وماعدد المرات التى تسافرها كل يوم كل اسبوع كـــل شهر كل سنـة .

٦ — مانوع وسائل النقل التى تستعملها عادة فى اسفارك : هل هى .. الطائرة .. السيـــارة — خصوصى .. او اجره — حافله ، او اى وسيلة نقل اخرى " اذكرها اذا سمحت" ....

٧ — ماهى المدينة او البلد التى تذهب عادة اليها اكثر من غيرها " اذكر اسم المدينة "..... وماهو الغرض .. هل هو للتسوق .. وقضاء بعض اللوازم او انه للعمل ... لقضاء بعض الاعمال التى تتعلق بعملك ومهنتك " ضع دائرة على الكلمة التى تحتها خط " :

" الخدمات العامـــة "

١ — مانوع الخدمات العامة المتوفرة فى منطقة سكنك : مثل : مستشفى ، مدرسة ، مستوصف ، عيـادة طبيب ، مسجد ، مكتب بريد ، بنك ، سوق ، دكاكين — مانوع الدكاكين .....

٢ — مانوع الوقود المنزلى الذى تستعمله اكثر من غيره فى مسكنك فهل هو الكهرباء ... الغاز .... او اى نوع آخر اذكر ذلك ..... وماهو السبب الرئيسى فى استعمالك هذا النوع ..... ؟ فهل لرخصه اكثر من غيره ..... او لماذا ..... ؟ .

" التسوق والســـوق "

١ — كيف تقضى لوازمك اليومية : هل تقضيها من السوق او الدكان القريب من منزلك ؟ " ضع دائـرة على الكلمة الموافقـة " .

٢ — هل تفضل ان تشترى لوازمك من دكاكين بائعى المفرق نعم .. لا ... او من دكاكين بائعـى الجملة نعم ... لا ..... ،

٣ — من اى مكان عادة تشترى الاشياء الآتية : — (أ) الاغراض المنزلية ، والاشياء الكهربائيـة " عين الدكان والشارع الذى يقع فيه الدكان واسم البلد الذى يقع فيه الشارع " .

نوع الدكان :

اسم الشارع :

اسم البلـد :

(ب) الاحذية النسائية ، والرجالى واحذية الاطفال : " عين كسابقه نوع الدكان والشارع والبلد " .

نوع الدكان :

اسم الشارع :

اسم البلـــد :

(جـ) الملابس النسائية والرجالى وملابس الاطفال او الاقمشة " كسابقه عين نوع الدكان، والشـــارع، والبلد " .

نوع الدكان :

اسم الشارع :

اسم البلـــد :

٤ ــ هل تفضل ان تشترى لوازمك من الكماليات بالتقسيط نعم .. لا ... ولك من مرة قد اشتريت بالتقسيط ومانوع البضاعة .....،

٥ ــ هل تفضل ان تشترى لوازمك من الكماليات " كاشر " ليس بالتقسيط ... نعم ... لا .... ومانوع هذه البضاعة التى تفضل ان تشتريها ....،